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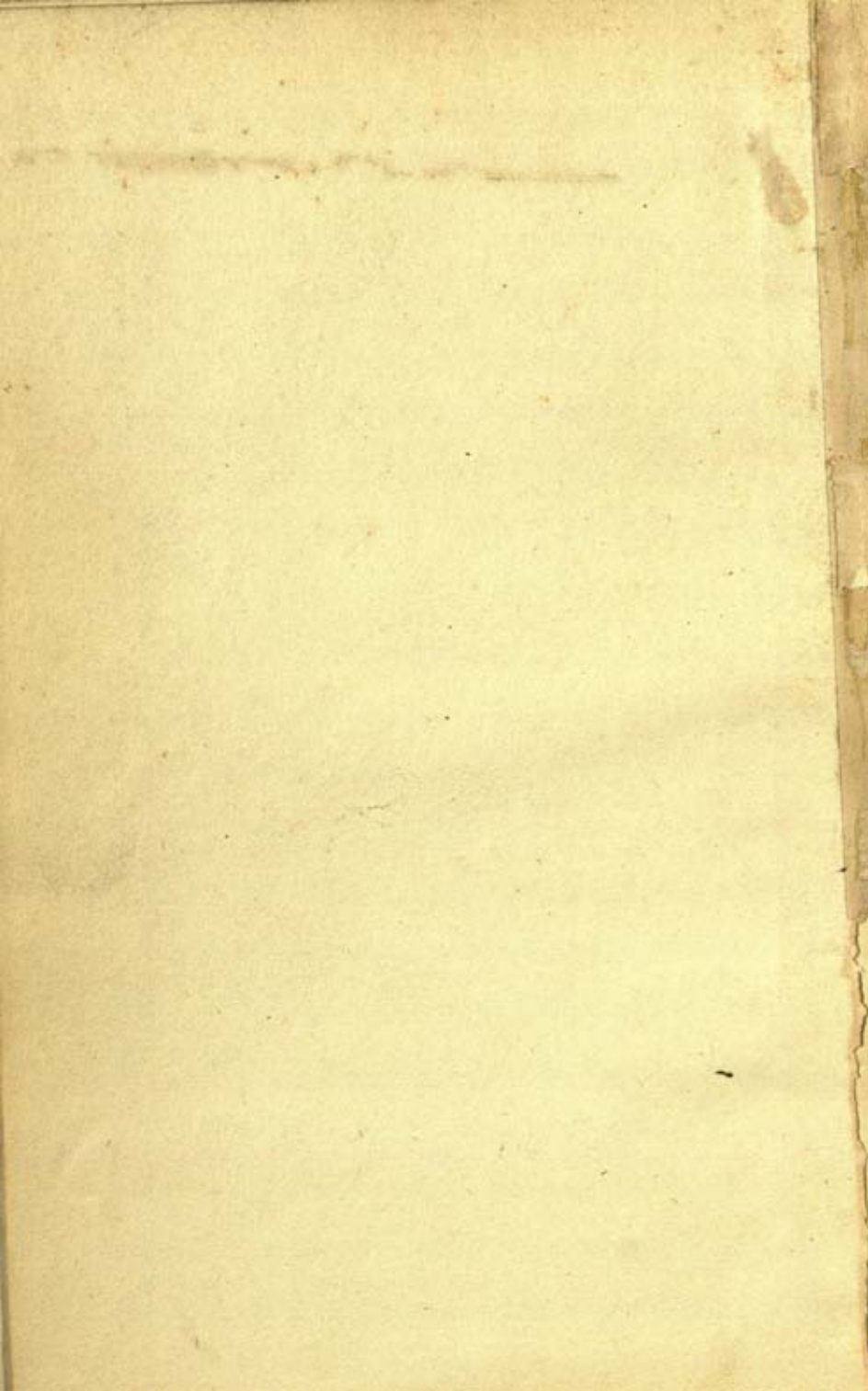
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THE
JOURNAL
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OF
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VOL. XV.

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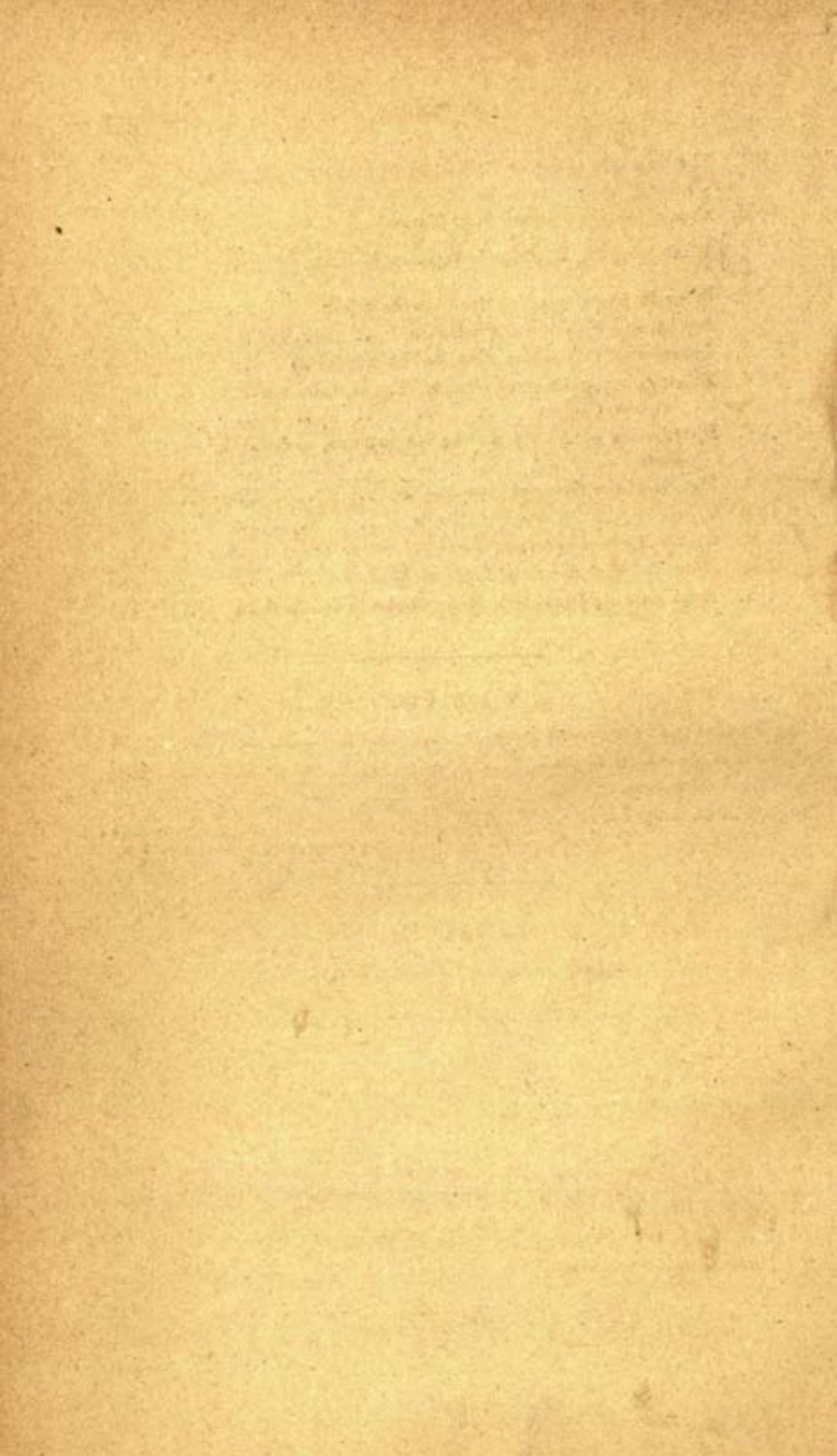
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ERRATUM.

Page 123, line 21, for *had*, read *add*.





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COMPOSITES.

FRANCIS GALTON, F.R.S. PHOTO.
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ILLUSTRATIONS OF COMPOSITE PORTRAITURE.

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THE JOURNAL
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ANTHROPOLOGICAL INSTITUTE
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FEBRUARY 10TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From FRANCIS GALTON, Esq., M.A., F.R.S.—*Erhebungen ueber die Farbe der Augen, der Haare und der Haut bei den Schulkindern Oesterreichs.* By Gustav Adolf Schimmer.
- From Professor FLOWER, LL.D., F.R.S.—*Amerika's Nordwest-Küste neueste Ergebnisse Ethnologischer Reisen.*
- *A Vocabulary of the Murray River Language.* By M. Moorhouse.
- *The Dieyerie Tribe of Australian Aborigines.* By Samuel Gason.
- From the AUTHOR.—*On the Delineation of Skulls by Composite-Photography.* By Arthur Thomson, M.B.
- *Grammaire Élémentaire de la Langue Quiché.* By A. Blomme.
- *List of Birds from Java.* By A. G. Vorderman.
- *Catalogue of Natural History Objects, Ethnological Specimens and Curiosities, exhibited by Lady Brassey at Hastings, 1884-5.* By M. Bryce-Wright.

From the AUTHOR.—Description of the Collection of Gold Ornaments from the "Huacas" or Graves of some Aboriginal Races of the North-West Provinces of South America belonging to Lady Brassey. By M. Bryce-Wright.

— Descriptive Sketch of the Physical Geography and Geology of the Dominion of Canada. By A. R. C. Selwyn, LL.D., and G. M. Dawson, D.Sc.

— Comparative Vocabularies of the Indian Tribes of British Columbia. By W. Fraser Tolmie and George M. Dawson, D.Sc.

From the ACADEMY OF SCIENCE, KRACOW.—Rozprawy i Sprawozdania z Posiedzen wydzialu Matematyczno-Przyrodniczego Akademii Umiejetnosci. Tom. XI.

— Zbiór Wiadomosci do Antropologii Krajowej. Tom. VIII.

— Lud. Serya XVI, XVII.

From the GERMAN ANTHROPOLOGICAL SOCIETY.—Correspondenz-Blatt. 1884. Nos. 11, 12.

From the IMPERIAL ACADEMY OF SCIENCES OF VIENNA.—

Sitzungsberichte: Philos-Histor. Classe, Band 104 Heft 1, 2.

" 105 " 1, 2, 3.

" 106 " 1, 2.

" { Math.-Naturw. Classe	{	I Abthlg.	1883.	Nos. 6, 7, 8-10.
		"	1884.	" 1, 3, 4, 5.
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		III	1883.	" 4, 5, 6, 7, 8-10.
		"	1884.	" 1, 2.

— Almanach, 1884.

From the ANTHROPOLOGICAL SOCIETY OF BERLIN.—Zeitschrift für Ethnologie, 1884. Heft 5.

From the ACADEMY.—Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg. Tom. XXIX.

— Atti della Reale Accademia dei Lincei. Serie 4, Vol. I, Fas. 1-3.

— Boletín de la Academia Nacional de Ciencias en Córdoba. Tom. VI, Ent. 4, Tom. VII, Ent. 1.

From the ASSOCIATION.—Journal of the East India Association. Vol. XVII, No. 1.

— Journal and Proceedings of the Hamilton Association. Vol. I, Part 1.

From the SOCIETY.—Transactions of the Imperial Society of Friends for Research in Natural Science; Anthropology and Ethnography. Moscow. Vol. XLV, Parts 1-3.

— Proceedings of the Royal Society. No. 234.

— Journal of the Society of Arts. Nos. 1678-1681.

— Bulletin de la Société des Sciences Naturelles de Neuchâtel. Tom. XIV.

— Journal of the Royal Asiatic Society. Vol. XVII, Part 1.

H. H. JOHNSTON.—*The People of Eastern Equatorial Africa.* 3

From the SOCIETY.—Proceedings of the Royal Geographical Society. February, 1885.

From the EDITOR.—Buletino di Paletnologia Italiana. 1834, Nos. 7-10.

—Materiaux pour l'Histoire de l'Homme. 1884, December.

—Revue d'Anthropologie. 1885. No. 1.

—"Nature." Nos. 794-797.

—Science. Nos. 100, 102, 103.

—Journal des Sociétés Scientifiques. No. 2.

—Revue Scientifique. Tom. XXXV, Nos. 3-6.

—Revue Politique. Tom. XXXV, Nos. 3-6.

The election of DOUGLAS W. FRESHFIELD, Esq., Lieut.-Colonel J. A. GRANT, C.B., F.R.S., and CUTHBERT EDWARD PEEK, Esq., M.A., was announced.

The following paper was read by the author:—

The PEOPLE of EASTERN EQUATORIAL AFRICA.

By H. H. JOHNSTON, Esq.

THE races which I intend to describe in the present paper extend over a region of Eastern Africa lying between the 1st degree north of the Equator and 5 degrees to the south, and bounded on the west by the 34th degree of east longitude and on the east by the Indian Ocean. I wish for the sake of comparison to enumerate all the known races inhabiting this wide stretch of country, but I shall more especially describe those dwelling in the vicinity of Kilimanjaro, the great snow-clad mountain mass, where I have recently been residing for six months.

The country which lies between the Victoria Nyanza and the coast, and is circumscribed by the limits I have just cited, offers many peculiarities of conformation worthy of remark inasmuch as they doubtless influence the races of men inhabiting those regions. Beyond the fertile cultivated coast-belt, which is rarely more than ten miles broad, begins the Nyika, a strange "wilderness," as its name imports, covered with harsh repellant vegetation and almost unprovided with running water. Here the rainfall is scanty, and the country bears a parched look all the year round. This semi-desert, except where it is broken by mountainous districts or intersected by great rivers, extends uninterruptedly to within a short distance of the eastern shores of the Victoria Nyanza, and is indeed the prevailing type of scenery throughout

Africa, for the Dark Continent is on the whole less forested than any other part of the tropics. But as a happy contrast to this dreary "veldt," as it is called in the south, rise the magnificent mountain systems of Usambara, Taïta, Pare, Uguéno, Kilimanjaro, Kiulu; not to mention other mighty ranges which Thomson has made known to us, and which offer from his description the same characteristics as those I have myself explored. Another break in the Nyika is made by the courses of perennial rivers flowing to the Indian Ocean, such as the Ruvu, or Luvu, the Tzavo or Sabaki, the Tana, and a few minor streams of less importance. The marked distinction between the outward aspects of the well-watered forest country on the banks of rivers or amid high mountains, and the great rolling plains sparsely covered with stunted trees or thorny scrub which I call the Nyika, is carried out further in the races of man inhabiting either. The forest country on the hills or along the rivers is occupied by resident agriculturists almost exclusively belonging to the Bantu family, ethnologically and linguistically, and the forbidding wilderness in the plains is ranged over by tribes of either Galla or Masai origin, both of which may be roughly classed with the Ethiopic or Hamitic group. In the extreme north-east the recent excursions of the Somal tribes have brought them into contact with the Gallas, to whom, indeed, they seem to be closely allied in origin. Besides the two important divisions of Africans already alluded to, viz., the Bantu and the Ethiopic, other natural families are represented. There is a curious colony of Nilotic negroes settled on the eastern bank of the Victoria Nyanza, who in their language, at any rate, are allied to the Shilluks and other negroes of the Nile. Ancient Arab settlements on the coast represent the Semitic family in this congeries of peoples, while much yet remains to be ascertained about the relationships and affinities of the reported dwarf races lying between Kilimanjaro and the Nyanza and the curious helot tribes known as the Wa-boni, Wa-sanania, Wa-ta, Wa-ndurobo, and others whose very designation is foreign, as you may observe by the Swahili prefix "Wa" which precedes them.

I shall not say anything about these dwarfs and helot races to-night, as I have had few or no opportunities of examining them; but I would remark that some of the tribes of Wa-ndurobo or A-ndurobo, whom I have seen living with the Masai as a helot race of hunters and smiths, seemed to me from their physiognomy negroes of a low type, and very different in outward aspect from both the Masai and Bantu people around them, especially in the conformation of the lower limbs, which were relatively short and somewhat bowed, with a negro's shin.

As to the Nilotic negroes of Kavirondo there is little doubt that they inhabit the eastern bank of the Victoria Nyanza. From the specimens of their language received through Swahili traders and communicated to the missionaries on the coast we see that they are, philologically at any rate, distinctly related with Shillucks of the White Nile, and must represent a curious and isolated colony of negro stock, the remnant of some former invasion now surrounded on all sides by tribes of alien origin. They are only known as yet from the descriptions of Swahili traders, and no European has visited their country save in the hasty coasting trip along their coasts which Stanley made when circumnavigating the Victoria Nyanza. Thomson in reality missed Kavirondo altogether, and really reached the country of U- or Bu-nyara to the north; for he tells us the people of this district, which he calls "Upper Kavirondo," were Bantu in origin and language, and differed wholly from the people of Kavirondo proper to the south.

I will now proceed to consider the people of Bantu race which are known to inhabit this part of Africa.

From somewhere to the south of the Island of Lamu, in about 2° S. latitude, down to Algoa Bay in Cape Colony, the east coast of Africa is held by the Bantu race, mingled slightly here and there with the blood of Arabs or Portuguese, where these nations have been in long possession as rulers. From Lamu down to the coast opposite Zanzibar the tongue chiefly spoken is Ki-swahili, but there are also local dialects, such as Ki-nika, peculiar to the inhabitants of the district round Mombasa, and Ki-bondei, the language of the low country between Usambara and the sea. On the great Dana river, which flows through Southern Gallaland and takes its rise about the southern slopes of Mount Kenia, we have the interesting Wa-pokomo dwelling just along the river banks and surrounded north and south by Gallas. Fragments of Bantu people are also reported to the east and north of Kenia, and to the south of that mountain we have the district of the Wa-Kikuyu, who, according to Thomson, speak a dialect closely related to that of their neighbours to the east, the A-kamba, which latter tribe extends southwards to the borders of Taïta. The clump of mountains known as Taïta is separated by about forty miles of uninhabited plain from the lovely country of Usambara, which again is inhabited by Bantu people of several tribes, the Wa-sambara being only one but the dominating race, and the Wa-mbugu seeming to belong to a more truly indigenous stock. North-west of these, in the valley of the Ruvu, are colonies of the Wa-zegūa; then comes the mountain range of Pare, inhabited by the kindly Wa-pare; then the hill-tribes of Ugueno, the Wa-kahe in the plains of the upper Ruvu, the

interesting colony of Taveita on the river Lumi, to the south-east of Kilimanjaro, the populous states of Chaga round the southern and eastern flanks of this mighty snow-crowned volcano, and lastly a small colony of the same race inhabiting Mount Méru to the west.

Hitherto, I am conscious that my paper has been a bare record of names, and that you know nothing of the people, how they live, how they feel, or anything beyond their merely geographical existence. I will therefore endeavour to describe them somewhat in detail, especially those with whom I have come into personal contact during my expedition to Kilimanjaro.

After leaving Rabai, near Mombasa, we encountered no inhabitants until we reached the hills of Maungu, on the borders of Taïta. Here some people came and sold us honey and spoke to us in the Ki-taïta dialect. At Ndara and Bura we subsequently saw more of the Wa-taïta, and many of them afterwards emigrated to Taveita and Chaga, and even entered my service as hunters and scouts, so that I was enabled to see a good deal of them from first to last, and take down vocabularies of their dialect.

In outward appearance the Wa-taïta are unprepossessing. They are about the medium height, the men varying generally from 5 feet 2 inches to 5 feet 7 inches, and the women from 4 feet 11 inches to 5 feet 3 inches. They have fairly good figures, the limbs, especially the legs, are well formed but the men are somewhat effeminate and slight looking. In facial aspect there is much variation. While many have little pug noses with no perceptible bridge, and a much rounded, projecting forehead, others exhibit an almost Red Indian physiognomy, with aquiline noses, high cheekbones, and retreating foreheads. The teeth are artificially filed and sharp pointed, but are naturally set somewhat wide apart in the jaw. The whites of the eyes are much clouded. The ears are so tortured and misshapen by prevailing fashion that it is hard to guess their original shape. The body is disposed to be hairy, but is carefully depilated all over, even to the plucking out of eyebrows, eyelashes, beard and moustache. The colour of the skin is generally dull, sooty black, but this is often disguised by the coating of soot or red earth and fat or castor oil, which is rubbed over the skin. The hair is generally shaved all round the head and only allowed to grow on the occiput. Here it is much cultivated and pulled out into long strings, which are stiffened with grease and threaded with beads. Beads, indeed, are the adoration of the Wa-taïta. The women wear massive collars of them, sometimes 6 inches broad and 3 inches deep, which are placed round the neck, and sometimes so lift up the chin as to compel the wearer to keep the head well thrown back. Several hundred strings of beads are bound round the waist,

smaller bands cross and recross the back and breasts, they are banded round the shaven part of the head, they hang in scattered strings from the temple downwards, they decorate the tiny "tablier," or leather apron which is worn for purposes of decency, and the borders of the two-tailed leathern garment which hangs on the back and legs are also edged with beads of various colours. In both sexes the lobes of the ears are pierced, and the hole is widened until the distended flap of skin nearly reaches the shoulder. When this result has been attained, many rings of beads are inserted, and continue to weigh down the distorted ear, the outer auricle of which is further pierced and hung with beads of a larger kind. This hanging the ears with beads is peculiar to the Wa-taïta, the other mountain races in the vicinity employing for the like purpose fine iron chains, bolts of wood, or rings of wood or ivory. There are but slight traces of religion among them. They are afraid of spirits, who are supposed to dwell in large forest trees, and perhaps for the reason that their dead are always buried in the forest. The country is but slightly wooded, but on the hill-tops clumps of high trees are religiously conserved. The baobabs among these people, as among others East African races, are looked upon as particularly the abode of spirits. The word for God in their language is *Mulungu*, but I more than suspect it is a borrowed term from the coast tribes, and that "*Eruwa*," *Sun*, is their true conception of an overruling deity. Among the Wa-pare, the Wa-gweno, the Wa-taveita, and the Wa-chaga the word for "sun" and "God" is identical. *Mulungu* is in use among the A-nika, and the A-kamba, and *Muungu* and *Mungo* among the Wa-swahili and the Wa-pokomo. All these variants descend from an original form, "*Mu-n-kulu-nkulu*," which is most closely preserved in the modern Zulu "*U-nkulunkulu*." The adjective "-kulu" in nearly all Bantu tongues has the meaning of great or old. To this was added the "n" prefix, then the personal prefix "mu," so that finally the combination meant the "old, old one," for great and old in this sense are almost synonymous, and Bleek conjectures the term to have been a relic of ancestor worship, or the deification of some tribe-founder.

One other incident may be mentioned about the Wa-taïta before I leave them. Their marriages are arranged first by purchase, the intending husband paying the father of the girl the three or more cows fixed as the price. When these preliminaries are settled the girl runs away and affects to hide. She is sought out by the bridegroom and three or four of his friends. When she is found, the men seize her and carry her off to the hut of her future husband, generally each man holding a limb, so that she is supported by four men including the bridegroom. On arriving

at their destination, being accompanied on the way by bands of laughing girls and women, she enters the hut with her four captors, and each in turn enjoys her. Then having been in this strange manner repaid for their services, they leave her to the exclusive possession of her husband. She remains with him for three days, then is escorted back to her father's house by another procession, and finally returns to her future home to take up the cares and duties of domestic life.

The language of the Wa-taita is about intermediate between the dialects of the coast and those of Chaga.

The A-kamba, who live on a broad stretch of country to the north of Taita nearly to the base of Kenia, are the neighbours of the Gallas on the coast. They are very roving, colonising people, and great hunters. I have seen many of them at Taveita, whither they would bring rhinoceros horns and dried rhinoceros flesh for sale. These are on the whole a good-looking race, and I was surprised to find in many that the hair, though short, is straight, which together with a light skin shows an intermixture of Galla blood. They are slightly clothed in leathern coverings with a certain regard for decency.

The beautiful forest district of Taveita is inhabited by two different colonies. One a Kwavi people of Masai origin, and the other and more primitive a most interesting Bantu tribe, the Wa-taveita, who exhibit marked peculiarities in their language and ideas. Let me begin by saying that they are one of the pleasantest people I have ever encountered in Africa. They are of fair height, some of the men being both tall and robust, and attaining occasionally 6 feet in height. Their figures are often models of symmetry and grace. They anoint the body with oil and ochre, as do the neighbouring people already described. The hair is dressed in many fashions, more often divided with fat into separate strips and the whole united in a pigtail at the back, or else allowed to hang in long locks about the face and shoulders. They frequently let the beard and moustache grow, and generally abstain from plucking out eyelashes and eyebrows, as is done elsewhere, though this is also occasionally practised at Taveita. Circumcision is general. Marriage is of course a matter of purchase, but no sign of imitating capture seems to be practised here. If the young man cannot afford to pay for his wife at once, he gives over to the father a certain portion of the price, and his intended bride is betrothed to him and carefully prevented from communicating with other males until the rest of the purchase is paid. Then she becomes a wife, and directly signs of pregnancy are manifest she is dressed with much display of beads, and over her eyes a deep fringe of tiny iron chains is hung, which hides her and also prevents her from seeing clearly.

She is generally accompanied by an old woman, who is deputed to screen her from all excitement and danger until the expected event has taken place; after which little further fuss is made, and other succeeding children are born without any extra precautions being taken.

After marriage the greatest laxity of manners is allowed among the women, who often court their lovers under the husband's gaze; provided the lover pays, no objection is raised to his addresses. Both sexes have little notion or conception of decency, the men especially seeming to be unconscious of any impropriety in exposing themselves. What clothing they have is worn either as an adornment or for warmth at night and early morning. These people are affectionate and kindly in their family relations, and to give you a better glimpse of how they live and feel I will cull the following extract from my diary, which describes the visit paid to a native's compound in Taveita:—

"Early this morning many friends came with offerings of milk, fowls, bananas, &c. One man wanted me to come to see him at his home, so I went thither with my servant. Round his little compound was a kind of fence formed of the long midribs of the Mwale¹ palms laid lengthways. There were three houses inside: one for the women, one for the goats and sheep, and one for the man. His dwelling, though small, was far from uncomfortable, and the interior was remarkable for the neatness that characterises the domestic arrangements of most Africans. There was a raised dais for the bed, on which skins were laid; a little three-cornered stool to sit on; a fire burning in the centre of the floor; spears, knives, horns of animals, and many other articles ranged to dry round the walls. At the man's earnest request we partook of sour milk and sugar-cane. He also wished us to try some rather dirty half-fried fish, but this I was obliged to decline. Whilst I sat talking to him, his wife, a motherly-looking soul, appeared leading a small, rather unhealthy child, and was further followed by a genial old hag, my friend's mother. This latter was a merry social old body, though very monkey-like as she sat and chewed sugar-cane, holding it before her with both hands and gnawing it laterally with her teeth, while the further end of the cane was clutched between her lean thighs. My host caught his child to him with unmistakable parental affection. He carefully pinched and pressed the great protruded stomach, as if divining this to be an unhealthy symptom. Seeing he was anxious, and wishing to say something kind, I offered to send medicine, which in the Swahili tongue is

¹ A species of *Raphia*.

expressed by an Arab word 'Dawa.' But he only replied, 'Dawa, what do we know of Dawa?' Then he looked up to the sky in quite a simple way and said, 'Perhaps Muungu will cure him? who knows?—the other one died.' 'Then you had another child?' I asked. 'Yes,' he said, 'but Muungu took it.' He looked again at his child, and seeing its eyes were flecked with mucus he cleaned them with great sucking kisses. At length I rose and said in a roundabout way I had better be going. He put the child from him with a sigh and rose and followed me to my camp, carrying a present of bananas."

The people of Taveita subsist mainly on vegetable food, of which they rear a great variety in their beautiful gardens. They also eat fish and meat. The fish are caught in the river Lumi, which runs through the settlement, by means of skilfully made wicker-work traps and weirs. They also construct from the midribs of a *Raphia* palm most clever rods and lines, the whole material coming from the palm, with a native-made iron hook superadded.

The Wa-taveita proper number about two thousand. They bear an excellent reputation among the coast traders for honesty and friendliness. They speak Ki-swahili almost universally, and speak it with singular correctness; but of course among themselves Ki-taveita is the only language used. This very interesting Bantu dialect offers many curious features and retains a number of archaic words in its vocabulary. It is somewhat midway between Ki-kamba and Ki-chaga, but offers independent features of its own. So much intercourse with traders from the coast seems to have slightly robbed them of originality, and in their modes of life and forms of belief they somewhat ape the Wa-swahili. Many of them are almost Mohammedans. I noticed one little detail as regards fire-making which is worth recording. To produce fire, which is done in the common African way by rapidly drilling a hard pointed stick into a small hole in a flat piece of wood, is the exclusive privilege of the men, and the secret is handed down from father to son, and never, under any conditions—so they say—revealed to women. I asked one man why that was. "Oh," he said, "if women knew how to make fire they would become our masters." Nevertheless, without this drawback, the fair sex in Taveita have pretty much their own way. I have known one or two leading matrons who have always insisted on having their voice in the deliberations of the Wazēē, or elders, who govern Taveita. I have referred to their laxity of conduct after marriage, but it springs so much from amiability of disposition that it can hardly be called vice. In short, a more kindly, sensible, considerate set of beings I have never met than the Wa-taveita.

The Wa-chaga of Kilimanjaro do not altogether resemble them. They are neither so pleasing in appearance nor in disposition. Sometimes they attain a fine stature, as in the case of Mandara, the chief of Moshi, but generally they are short men. The women, however, are at times very good-looking, and have wonderfully fine figures. In fact, the ordinary rule amongst Africans is here reversed, and the women are handsomer than the men. Amongst these people we again meet signs of marriage by capture, but in their case it does not seem to be as I have described in the Wa-taïta, for the bridegroom is quite equal single-handed to the capture of his wife, and certainly not disposed to reward his friends in the same manner as the less exclusive Wa-taïta husband. On several occasions when I observed a marriage ceremony during my residence in Chaga, the intending husband went to his future wife's home, seized her in his arms and carried her off pig-a-back to his own residence, she screaming lustily and crowds of laughing friends following behind. On arriving at the husband's hut the marriage is generally consummated in public, and should the woman be found a virgin there are loud cries of rejoicing. Should the husband, however, fail to satisfy himself as to this point there are mutual recriminations, often ending in a loud-voiced wrangle, and sometimes the woman is returned to her father, who repays the marriage price. More often the matter is arranged by mutual concessions. The Wa-chaga are not markedly immoral; in fact, as they have come but very little into contact with Mohammedans they may be said to ignore real vice; but they are nevertheless the most utterly shameless people I have ever encountered. With them indecency does not exist, for they make no effort to be decent, but walk about as Nature made them, except when it is chilly, or if they wish to look unusually smart, in which cases they throw cloth or skins around their shoulders. Circumcision, if performed on the male, which it is not universally, is generally done after the age of puberty.

The Wa-chaga share with the Masai, whom they may have copied, a curious habit of *spitting* on things or people as a compliment or sign of gratitude. I remember one man, after I returned to my settlement in Chaga from a short trip to Taveita, was so pleased at my safe return that he took my hand in his and spat repeatedly at the sky, saying constantly "Erua icha!"—"God is good!" They have but a vague idea of the deity. Indeed one never knows whether or not he is identical with the sun, for that luminary bears just the same name, "Erua." It is interesting to notice, in contradistinction to the derivation of the name of God I recently gave as coming from ancestor worship, that among other African nations the deity is identified with the

sky or the sun. Thus there is the term "Erua" already referred to, which indicates "God" in Ki-chaga. Among the Ki-taveita it is "Zuwa," also "Sun," although the Swahili have lately introduced their word, Muungu. The form "Erua," "Zuwa," is identical in origin with the Swahili "Jua," the Luganda "Njuba," the Congo "Ntuva," all meaning sun, and all remounting to an archaic form "Nduba." On the upper Congo the Ba-yanzi have but one word for God and Sky—"Ikuru," or "Likulu."¹ Even among the Gallas "Waka" means indifferently God and Sky, and in the Masai language "Engai" (a feminine word) means both God, Sky, and Rain.

However, to return to the subject of the Wa-chaga. Though having little religious belief, they are very superstitious, and have great dread of sorcery. Large trees are supposed to be much affected by ghosts, and for this reason are spared by the axe. Their dead are buried in these isolated forests, sometimes in hollow trees, sometimes in the ground. Hyænas generally dig them up and eat them—this being little cared for by the survivors.

The Wa-chaga are clever smiths, and forge all kinds of utensils, weapons, and ornaments from the pig-iron they receive from the country of Usanga near Lake Jipe. The forge is but a pair of goat-skin bellows converging into a hollow cone of wood, to which are added two more segments of stone pierced through the centre and ending in a stone nozzle which is thrust into the furnace of charcoal. The bellows are kept steady by several pegs thrust into the ground, and a huge stone is often placed on the pipe to keep it firm. After the iron has been heated white hot in the charcoal it is taken out by the iron pincers and beaten on a stone anvil. The Chaga smiths not only make spear blades and knives of apparently tempered steel, but they can fabricate the finest and most delicate chains. Out of a rhinoceros horn they will make a beautifully turned and polished club, carved by hand, for they have no turning lathe. Pottery is almost absent. Basket-work is carried to great perfection, and they can weave it so tightly that milk may be held in these utensils of woven grass or banana-fibre. The wooden platters that are here before you to-night show no little skill in shaping, as they are cut out of solid blocks of wood, and not joined in any way.

But it is in their husbandry that the Wa-chaga mostly excel. The wonderful skill with which they irrigate their terraced hill-sides by tiny tunnels of water diverted from the main stream shows a considerable advancement in agriculture. Their time is constantly spent in tilling the soil, manuring it with

¹ The stem, *Kuru*, *Kulu*, however, is identical with the universal Bantu word for "great."

ashes, raking it, and hoeing it with wooden hoes. All their agricultural implements, except the choppers, adzes, and sickles, are of wood—wooden hoes, wooden stakes, and so on. They have a very clever mode of irrigating equally a given surface. As the little canals of water are always elevated above the cultivated plots, they will tap it at a convenient spot above the bed to be watered, and then turn the stream into a rough conduit made of the hollow stems of bananas cut in half, the end of each stem overlapping the next. Then as the water enters the last joint it is freely turned right and left, dispersing the vivifying stream in all directions.

The food of the Wa-chaga is mostly vegetable. Fish are absent from the streams of their country; but, moreover, like the Wa-taïta, they think them unfit to eat, and of the same nature as serpents. They breed fowls in large numbers, but merely to sell to the passing caravans of traders from the coast, for they themselves abjure poultry as food, thinking it unwholesome and unmanly. Their other domestic animals are the ox, the goat, the sheep, and the dog, though the latter animal is rarely seen. The oxen are much valued. They belong to the humped Zebu breed prevalent throughout East Africa from the days of the ancient Egyptians. The goats are small and handsome, with poorly developed horns, drooping ears, and often two small appendages of skin in place of the ordinary beard. The sheep are of large size, hairy, with fine dewlaps and drooping ears. The male has an enormously fat tail, developed to such an extent as to really impede his movements. A fine sheep may be bought for from 4 to 8 yards of cloth, a fat goat for about the same cost, and a milch goat a trifle dearer.

Milk enters largely into the diet of the Wa-chaga, and they are also passionately fond of warm blood fresh from the throat of a newly slaughtered animal. Whenever I killed an ox for my men—who being Mohammedans insisted on cutting its throat and letting it bleed to death—the Wa-chaga would assemble with their little wooden bowls, and as the animal lay in its death throes on the ground, the hot purple blood spurting at high pressure from the severed veins, the eager natives filled one after the other their wooden vessels and then stepped apart from the crowd to drink the coagulating gore with utter satisfaction and a gourmet's joy. They are great flesh-eaters when they can afford it, but, as I have already said, their main diet is vegetable. Among the plants grown for food are maize, sweet potatoes, yams, arums, beans, peas, red millet, and the banana. Tobacco is also largely cultivated, and the natives chew it and consume it as snuff mixed with salt. Honey is produced in immense quantities by the semi-wild bees which make their hives in the

wooden cases put up by the natives among the forest trees. A large barrellful may be bought for two yards of cloth.

The Wa-chaga inhabit the western, southern, and eastern slopes of Kilimanjaro. The northern side of the mountain is without any other inhabitants than roving bands of Masai. The principal Chaga states, beginning on the west, are Shira, Kibong'oto, Machame, Uru, Kibosho, Mpokomo, Moshi, Kirua, Kilema, Marang'ú, Mamba, Mwika, Rombo, Useri, and Kima'ngélia. Although these little states are perpetually quarrelling among themselves, they are nevertheless closely united by ties of blood and possess a common language. Ki-chaga is a very interesting Bantu dialect, preserving many of the prefixes in apparently archaic forms. It is intermixed with a few Masai terms in its vocabulary, but its grammar is perfectly untouched.

The inhabitants of Méru, Kahé, and Ugwenó speak dialects closely allied to Ki-chaga. The tongue of Ugwenó is, if anything, more archaic than the others, and offers most interesting points for consideration. I have made a careful study of all these dialects, and hope to publish the results shortly.

I will conclude my paper by a few words on the two remaining races to be noticed in this hasty review of the Ethnology of Eastern Equatorial Africa—the Masai and the Gallas.

The Masai are a well-marked variety of African man ranging like semi-nomads over the vast tract of plain country between one or two degrees north of the Equator and 5° 30' south. They certainly had their origin northwards, and in all probability merge into races inhabiting the great unknown tract lying between the Nile and Gallaland. The Masai primarily admit of two great divisions, the Masai proper and the so-called Wa-kwavi, or El-Oigob. These two peoples, who are of the same stock and speak almost identically the same language, are nevertheless in perpetual conflict. The Wa-kwavi, as they are always called by the Wa-swahili traders, are Masai who have, through loss of cattle and other reasons, become settled agriculturists, and have adopted a peaceful and honest mode of living. The Masai proper still live a semi-nomad life, do not till the soil nor cultivate, keep huge herds of cattle and goats, and are bold and daring robbers. I call them semi-nomads because each tribe ranges generally over a given district and within certain limits. They also live in their quickly constructed towns during the rainy months. A Masai town or village consists of a huge circle of low huts, surrounded by a thorn fence. In the middle of this enclosure the cattle are kept at night. Their huts are generally built as follows:—First making a rough framework of pliant boughs, which are bent over and stuck in the ground at both ends, they plaster on this a mixture of mud and

ox-dung, and for further resistance to heavy rain hides are thrown over the top outside. The height of the dwelling barely exceeds 4 feet. There is a low porch-like door. The only attempt at a bed is a hide laid across a row of sticks.

The Masai youth is circumcised in a peculiar manner at the age of sixteen, and then enters the clan of El Moran, or the unmarried fighting men. Whilst in this condition he strictly confines himself to a diet of milk and meat. Moreover, he must not mix these two things, but before changing from one to the other must take a powerful purgative, so that, for instance, if he had been living on milk, and wishes to eat meat or drink blood, he must thoroughly clear his system before changing.

With the company of young warriors dwell numbers of unmarried girls, and a very dissolute life is led. At about the age of twenty-five to thirty the Masai warrior selects a girl as his wife, marries, and entirely changes his mode of life. His diet is now unrestricted, and he varies his milk and flesh with vegetable food and honey. It is now his object to acquire a large family of children, and his disposition becomes wholly altered from that of a bloodthirsty, vicious, ruffian to a dignified gentlemanly man. The Masai believe in a vague supreme being whom they call Engai, a word also meaning "the sky," or "rain," as I have previously mentioned. The Masai language is an exceedingly interesting one. It is sex-denoting, uses a definite article of two genders and two numbers, has several modes of expressing the plural, principally by suffixes and lengthening the word, it conjugates its verbs by prefixes and suffixes, and uses *pre*-positions and not *post*-positions. But the most remarkable points that my slight study of it has revealed to me are the distinct though distant signs of relationship it bears to the Galla. Now is not the time for me to enter on a prolonged philological argument, but I hope at some future time to be able to work up the proofs necessary to establish this interesting fact.

The Gallas are advancing somewhat southwards in the direction of Mombasa, pushed on from the north by the hordes of turbulent Somalis. The Gallas are a race that there is some hope of civilising; they are at any rate not impossible to deal with—nor, with all their savagery and love of bloodshed, are the Masai, for whom also we may hope a brighter future, when they become encircled with civilisation; but the Somali! If it were reasonable to wish for the extermination of a whole race after the fashion of bygone Spanish colonisation, I could wish that race in Africa might be the Somali. Added to their naturally fierce and inhuman disposition, they have become fanatical Mohammedans and offer the greatest barrier to the opening up of that great eastern horn of Africa that can possibly exist.

FEBRUARY 24TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From the DIRECTOR OF THE BUREAU OF ETHNOLOGY, U.S.A.—Second Annual Report, 1880–81.
- From the AUTHOR.—Die Verbreitung des Blonden und des Brünetten Typus in Mitteleuropa. By R. Virchow.
- Ein Weiterer Beitrag zur "Nephritfrage." By A. B. Meyer.
- From the ACADEMY.—Boletín de la Academia Nacional de Ciencias en Córdoba. Tom. VII, Ent. 2^a.
- Atti della Reale Accademia dei Lincei. Serie 4, Vol. I, Fas. 4.
- From the ASSOCIATION.—Proceedings of the Geologists' Association, 1884. No. 8.
- Proceedings of the American Association for the Advancement of Science. Minneapolis, 1883.
- From the INSTITUTION.—Journal of the Royal United Service Institution. No. 127.
- From the COLLEGE.—List of the Fellows, Members, Extra-Licentiates, and Licentiates of the Royal College of Physicians, 1885.
- From the SOCIETY.—Proceedings of the Philosophical Society of Glasgow, 1884–5.—President's Address. By H. Muirhead, M.D.
- Journal of the Society of Arts. Nos. 1682, 1683.
- From the EDITOR.—Matériaux pour l'Histoire de l'Homme. Jan., Fév., 1885.
- "Nature." Nos. 798, 799.
- Science. No. 104.
- Revue Scientifique. Tom. XXXV, Nos. 7, 8.
- Revue Politique. Tom. XXXV, Nos. 7, 8.

Mr. F. GALTON exhibited a collection of composite photographs illustrating Jewish types.

The following paper was read by the Director:—

NOTES on the RACE-TYPES of the JEWS.

By DR. A. NEUBAUER.

THE history of the Jews from the earliest period up to our own time has been written and re-written many a time, by various authors and from various points of view. Jewish literature, biblical as well as post-biblical, has occupied many scholars for centuries, and we have arrived at a fair knowledge of it. Jewish customs and manners, both old and new, their thoughts in all branches of learning, their ethical teachings—all these have found champions. And scholars have generally agreed that the Jewish race have kept their blood unmixed. "It is the only pure race in Europe," says Dr. Andree, "besides the gipsies." This opinion is chiefly based on the fact that a Jew is almost at once recognised amongst thousands of others. The scanty intermarriages (a subject which I shall mention later on), they allege, did not disturb the individuality of the race. In the earliest times we find Abraham's son Ishmael becoming the father of the Arabic race, because he was the offspring of Hagar, an Arabian woman. Her name is Arabic, meaning "the flying," from which root also the word *Hejra*, "the flight of Mahomet," is derived. Isaac as well as Jacob is reported to have married an Aramean wife; Joseph married an Egyptian, and Moses is blamed for having married a Midianite. David descends from Ruth, the Moabitess; Solomon is the son of a Hittite woman, Bath-Sheba, and he himself married foreign women. It is, moreover, likely that the children of Israel married in Egypt Egyptian women, for a "mixed multitude went on with them" (Exodus xii, 38). We are often reminded in the Bible of the non-Jewish women who came in frequent contact with the Israelites. From all this we should conclude that the Israelites of old were descendants of a mixed race, though the priestly caste might perhaps be excepted.

The practice of intermarriage was continued by the Jews who returned from the exile, as can be seen from the following passage in Ezra (x, 11): "Now therefore make confession unto the Lord God of your fathers, and do his pleasure: and separate yourselves from the people of the land, and from the strange wives;" and from Nehemiah (xiii, 23): "In those days also saw I Jews that had married wives of Ashdod, of Ammon, and of Moab." The "stranger" and the "sojourner" mentioned in the Bible, a kind of proselyte, as well as the functionaries and the warriors of non-Israelitish race who served under the kings of

Israel, did certainly increase the mixture of the races by marrying Israelitish women. During the time of the second Temple the proselytes became more numerous through intercourse with the Syrians, the Greeks, and the Palmyræans, and many professed to be converted to Judaism in order that they might be allowed to marry Jewish women. The higher classes of these proselytes are known in the Talmud under the name of "proselytes of the table of the Kings." But, says Dr. Andree, "all the intermixture with heathen women, which took place in Asia in old time, had little effect on the physical constitution of the Jews, because they mostly married women of Semitic tribes." This argument does not hold good, at all events, as regards the Egyptian and Greek women, for the latter entered Judaism in Asia Minor in no small numbers, and they no doubt prepared the field for the Apostles. How, in fact, could the Apostles have quoted so freely from the Old Testament to people of the lower and middle classes if a part of them were not acquainted with the Bible through conversion? They certainly had not learnt it in the schools, as was the case with the philosophers.¹

And we are able to adduce more positive evidence as to the intermarriage of the Jews with non-Semitic tribes. At Rome it is mentioned that a patrician woman of the name of Fulvia embraced Judaism, no doubt with a great number of friends and slaves. The conversions at Rome were so frequent that a heavy penalty was decreed against those who became circumcised. Of course the converts married Jews—if not always, at any rate frequently. The passage of Tacitus ("History," v, 5), where it is said that the Jews keep pure blood in the Roman empire, adding, "*Alienarum concubitu abstinent*," means that the Jews did not marry *heathen* women; with her conversion the woman ceases to be an *aliena*. It is said in the Talmud "that the Jewish population in the Roman empire is in proportion to that of Judæa, as regards purity of descent, like paste made of mixed flour compared to pure flour; Judæa itself, as compared to Babylonia, is also only paste." In another passage it is said concerning purity of descent, "Babylonia is sound, Mesene is dead, Media is sick, and Elam in its last moments," which means that in Babylonia the purity of descent is spotless, in Mesene mixed, in Media doubtful, and in Elam more than doubtful. Can there really be a doubt about the frequent intermarriage between Jews and non-Semitic tribes? And had these mixtures no influence on the physique of the

¹ I discard the opinion of Dr. Richard Andree ("Zur Volkskunde der Juden," Leipzig, 1881), that Israelites as early as the period of the Judges had acquired Greek slaves from the Phœnicians, who were known under the name of *Pilegesh* = *παλλαξ*.

descendants? That there were families who kept up tradition so strictly that no proselyte could enter into them is doubtless true, but such was not the case with all classes. And in other countries, like Persia, Arabia, the land of the Khazars, and elsewhere, the same process went on.

But let us now come to other European countries besides Rome. The Councils of Orleans (538 A.D.), of Toledo (589 A.D.), and of Rome (743 A.D.) prohibit intermarriage between Christians and Jews; the same prohibition was enacted in many other Councils in later periods and in many other countries. As long as conversions were allowed legally, or by some means tolerated, intermarriages frequently took place. The Jew has no preference for or any aversion from one race or another, provided he can marry a woman of his religion, and *vice versa*. (It is not the place here to explain the psychological ground for this.) Intermarriage and climate are, in my opinion, the reasons for the differences in appearance between Jews of various countries. That traces of the original race are in very many cases, and perhaps in most cases, left, cannot be wondered at. The same traces are to be found in the Celtic races, the Slavs, and the Latins, with the difference that intermarriages between these races have taken place on a larger scale than amongst the Jews.

It is, in my belief, outside the question to distinguish two different tribes of Jews—1st, those with a well-developed nose, black and striking eyes, and fine extremities—in one word, the noble race of the *Sephardim*, or the Spanish-Portuguese Jews; 2nd, those who have a thickish nose, large mouth, and curled hair, features which are represented amongst the *Ashkenazim*, or the German-Polish Jews. Even Jews with red or fair hair are pointed out, but not as a special type. But this is only a revival of the old legend which existed for a long time amongst the Jews themselves in the middle ages, viz., that the noble Spanish race are descended from the tribe of Judah and the rougher German-Polish Jews from the tribe of Benjamin. This legend had such effect that intermarriage between the Spanish and German Jews was for a long time avoided. Now this ethnological fact would only be possible if we could admit that removal or voluntary emigration was carried on in such a systematic way that the tribe of Judah spread in the East and went to the Iberic peninsula, and that the tribe of Benjamin settled in France and Germany, from whence it came to the Slavonic provinces. There is, however, no trace of such a systematic emigration, and surely the Romans did not care at that time for the distinction of the two tribes, when they sold them as slaves or transported them for the sake of the safety of the empire. If such a separation of

types were admitted, we should have to make a third one for the Italian Jews, who stand between the German and the Spanish Jews. Can it be shown that communities exist composed only, or in the majority, of Jews with fair or red hair and blue eyes? Certainly not. On the contrary, we find often in a family a part of the children having a dark complexion and another part with fair hair. This phenomenon must be ascribed to some yet unknown reason or to the influence of climate.

What is curious to notice is that the manners and habits of the so-called distinct tribes are also different, in accordance with the features, viz., the Spanish and Eastern Jews have a kind of refinement in speech and gesture, while the German-Polish Jews are rougher in both; and the Italian Jews lie again between the two. But this also must be attributed to the manners and speech of the nations amongst whom they lived, and with whom they were in daily contact. We shall go further;—there is even a difference in the literature of the mediæval Jews of the two so-called tribes. The Spanish Jews are much more logical and clear in their casuistic compositions, and dislike scholastic discussions, whilst the contrary is the case with the German-Polish Jews, whose casuistry reaches the climax of logical mistakes, of scholastic torture, and absurd thinking. The Italians stand again between these two in this matter. Can this be attributed to a difference between the two tribes, or not rather to the character and tone of the nations amongst whom they lived? Another difference must be noticed also in the pronunciation of Hebrew words. It lies chiefly in the clear *â*, the *é*, and the *th*, with the Spanish Jews; for which the German-Polish Jews have an *o*, an *i*, and an *s*. The gutturals are not distinguished by either of the Jews except by those who live amongst the Arabs, whilst the *ain* is, strangely enough, pronounced by the Italian and by some Portuguese Jews as a nasal *ng*. This difference of pronunciation is not tribal, but influenced by the languages spoken round them. In a word, there are no two distinct tribes amongst the living Jews, and they are not of wholly pure blood. I believe that it is quite imaginary to say that the Jews represented on Egyptian and Assyrian monuments exactly resemble the Jews now living. Certainly we find individuals who bear a resemblance to the Jews of the monuments, and who may be the remnants of families which took special care against intermarrying with proselytes; but the bulk of the Jews, if dressed in European costume, would present few characteristics by which they could be recognised. The only strong similarity existing amongst the living Jews is that they often still bear, more or less, the stamp of oppressed individuals, a stamp which they cannot get rid of

quickly, since there are many countries even now where they are treated like pariahs, and from whence they emigrate to more civilised lands; and these Jews are at once recognised in the streets, but not those who have shared in the advantage of civilisation and education. As I have already said, there remains something typical in the features, just as in the case of the Celts, Teutons, Slavs, and other tribes. That the Jews keep together is by no means due to a tribal instinct; they were forced to do so by the Ghettos, and such a habit cannot be got rid of in one generation. That it is not the race which holds them together, but the religious community, may be concluded from the fact that they are interested in the amelioration of the Jews in Russia and the East, as also in that of the Falashas¹ in Ethiopia, the black Jews in Cochins,² and the Bene Israel in India,³ who are certainly not of their race.

We pass now from the ethnological question to the anthropological results relating to the Jews. We shall find here also the same abnormal state of things and contradictory statements on the part of those engaged in research. Let me state at once that there exist no skulls or skeletons belonging to ancient Jews, and in all probability none will be found. In the climate where they are buried, none can be preserved except by embalming, which was not frequently in use in the Jewish nation. The dead were too much respected amongst the Jews of all ages to allow of any pathological examination of the corpse; indeed, every effort was always made, and is still made, in the orthodox communities of Poland, Hungary, and the East, to avoid a post-mortem examination. This is most likely due to the same superstitious repugnance that the Mohammedans have to amputation, in order that the body may be kept intact until the time of the resurrection. It is a matter of the greatest difficulty even now, as stated by Dr. Blechmann in his essay "*On the Anthropology of the Jews*" (*Ein Beitrag zur Anthropologie der Juden*, Dorpat, 1882), to induce a Jew to be

¹ The Falashas are a tribe which is not Semitic, but rather Nubian. The name Falasha means "immigrated"; they believe themselves to be descendants of the queen of Saba. Their language is a kind of Amharic, and they do not know Hebrew at all. Their Bible is written in Ethiopic, and their hymns in the vernacular language. They observe strictly the laws of the Pentateuch, except as to some local modification, but know nothing of the Jewish traditional interpretation, neither of the Rabbinic (the Talmud), nor of the Karaitic (of those who repeat the Talmud but have another traditional interpretation).

² Of the black Jews Dr. Buchanan says that he could not distinguish them from the Hindoos. The missionary, Joseph Wolf, says of them in 1833: "Their complexion is like that of the Hindoos; indeed, even at this time, many of the Hindoos at Cochins become converts to Judaism."

³ The Bene Israel are fixed in the neighbourhood of Bombay; they pretend to be descendants of the ten tribes, but their features are Hindoo. They do not know Hebrew at all, but observe the laws of the Pentateuch.

measured, so that we have to rely mostly for the physical state of the Jews on information gathered from examination for the general military service. We shall put together what is known about Jewish skulls from the dissertation of Dr. Blechmann. The first notices, he says, were given by Blumenbach, who states (in 1790) that a Jewish skull in his possession was recognised amongst many others as peculiarly formed, even by men whose speciality was not anthropology. His description is the following:—"Maxime quidem nasus aquilinus et mentum porrectum, tum vero etiam maxillæ superiores qua naribus subjectæ sunt in acutiorem angulum spinæ nasali continuum concurrentes. Suture non tantum genuinæ illæ ossium calvarie planorum, sed et reliquæ quas harmonias vulgo vocant, ad unum fere omnes senio decrepito confusæ et obliterate." Wachter (in 1812) gave after him a description of another skull which represents another Jewish type, most likely of a Spanish Jew. He confirms Blumenbach's statement, adding that he found in the external part of the orbit, where in general the temporal nerves lie, an important cavity or depression, whilst in the interior of the orbit he found an elevation. He also says that Professor Brugmans at Leyden had found the same peculiarities in two other Jewish skulls. Of course, in order to make this a standard peculiarity of Jewish skulls, many other skulls in all parts of the world must be examined. Blumenbach might have left unnoticed this peculiarity in the skulls which he possessed. As to the measure of Jewish skulls, Pruner-Bey (in 1864), who had three of them, gives 75 mm.; Welcker (in 1866), who examined eighteen skulls, found an intermediate skull with 78·4 mm.; he does not give the measure of each. Dr. J. B. Davis (in 1867), who examined seven skulls, finds the measure from 71 to 84, intermediate 77·1; finally, Dr. Weisbach (in 1878) gives the intermediate of 81·11, and from the measure of nineteen living Jews he gives the measure of 79 to 88, intermediate 82·15. So far for the skulls.

Dr. Blechmann gives statements of the height of the Jews, the measurement of the chest, the length of the arms and of the extremities, according to military reports in Russia, Germany, and the Austrian provinces, which are not very favourable to the physique of the Jews in general. They are short, measure in circumference less than half of the height, and they are very weak on the whole. Dr. Blechmann comes also to the conclusion that the differences in the measure of the skulls, which I have noticed above, represent different types of Jews, of which he admits also the two above mentioned, viz., the Spanish and German-Polish. He quotes authorities for it, such as Dr. Weisbach, Karl Vogt, Franz Maurser and finally Dr. Andree; the

information of the last is second-hand and inaccurate. No one of them makes out a special type of the Jews with fair or red hair, but they all firmly believe that neither intermarriage nor climate has had any influence on the physique of the Jews, and that the Jews of the present time greatly resemble those on the monuments of Egypt and Assyria. I have already doubted this, and stated my view as to the impossibility of two separate emigrations of two types. At all events no certainty can be attached to reports of the physical condition of the Jews until individuals are examined in the various parts of the world. Jerusalem, for instance, possesses Jews of the greatest variety and the beginning of the system of measurement could be made there, but they are all nearly half famished. Next, the state of health and the relation of the height to the size of the chest among the Jews in Yemen and Kurdistan, where they are shepherds, agriculturists, and artisans of all kinds, will have to be investigated. Only then shall we be able to decide why the descendants of the Macchabean warriors and of those who kept Titus and Hadrian thoroughly occupied for several years, are now proportionally less fit for military service and more delicate in health than their Christian brethren.

The following paper was read by the author:—

On the RACIAL CHARACTERISTICS of MODERN JEWS.

By JOSEPH JACOBS, Esq., B.A.

[WITH PLATES I AND II.]

IN the following research I have endeavoured to bring together all the data, scientific or historical, which bear upon the question of the purity of the Jewish race. I have found it necessary for this purpose to scrutinise somewhat closely many Jewish qualities and habits that have hitherto been regarded as peculiarly the results of race. Most of these, however, have been found to be due to social causes, and cannot therefore be regarded as primarily racial. Nevertheless I trust even the discussion of the secondarily racial qualities of Jews with which this paper opens may not be without interest to students of anthropology. They exhibit, I conceive, a striking example of the influence which the social life of man has upon his physical qualities. For a decision on the main question, I have been forced to turn

to history, which is on this occasion more than usually Janus-faced.

We have first of all to determine which are the Jews whose racial qualities we are to determine. I have made the following estimate, necessarily rough, of the various classes of persons now living, who may claim to be Jews by religion or by birth, or by both.¹

Name.	Country.	Number.	Per cent. of whole.
A. Jews both by religion and by birth			
Ashkenazim	Teutonia and Slavonia	6,925,000	98·9
Sephardim	Romance, Levant, Africa	6,500,000	92·8
Samaritans ?.. ..	Nablus	425,000	6·1
		150	..
B. Jews by religion, but not by birth			
		75,000	1·1
Falashas ²	Abyssinia	50,000	..
Karaites	Crimea	6,000	..
Daggatouns, &c. ³ ..	Sahara	10,000	..
Beni-Israel ⁴	Bombay	6,500	..
Cochin ⁵	Cochin	1,600	..
C. Jews by birth, but not by religion			
		12,000	0·2
Chuetas or Anussim ⁶	Balearic Is.	6,000	..
Maiminen ⁷	Salonichi	4,000	..
G'did al Islam ⁸ ..	Khorassan	2,000	..

Besides these, there exist a large number of persons, mostly in Europe, who have Jewish blood in their veins as descendants of Jewish converts. This is specially the case in Spain, where Jewish blood has filtrated through all ranks of society up to the very highest, and the same is said of certain districts of

¹ The best enumeration of Jews is by M. I. Loeb, art. "Juifs," in Saint Martin's *Dictionnaire de Géographie*: his chief errors are making the number of Russian Jews too low by a million, and the Falashas 200,000 instead of 50,000.

² Rohlfis in Petermann "Mittheil," 1883, p. 213.

³ Serour, "Les Daggatouns," 1880. I include in this number the Mavambu or Negro-Jews of the Loango Coast (*vide* Andree, "Volkskunde d. Juden," 1881, p. 90).

⁴ Census of India, 1881, gives 7,952 Jews in British Bombay.

⁵ "Jüd. Littblt," 1883, No. 36. The number of Jews in China is unknown.

⁶ Descendants of Spanish Jews still isolated. Lewin, *ibid.*, No. 30.

⁷ Descendants of followers of the Jewish "Mahdi," Sabbathai Zebi. Graetz in "Monatsft," 1884, Feb.

⁸ Jews forcibly converted to Islam thirty years ago, "Vesillo Israel," April, 1884.

mid France. The anthropology of Jews can never be satisfactorily settled till careful examination of these various data has shown their resemblances and differences. From the common qualities of classes A and B we can determine qualities due to religion; from those common to A and C, but differing in B, we might draw valuable conclusions as to influences of race. As a matter of fact, for the second and third classes we have practically no data to work with, except the vague impressions of travellers, and we must therefore confine our attention to the two chief divisions of Jews: (1) Sephardim, mostly descendants of the refugees from Spain in 1492, and now residing on the littoral of the Mediterranean,¹ and (2) Ashkenazim, dwelling in all the countries inhabited by Tentons or Slavs. The latter form an overwhelming majority (93 per cent.), and our information about them is tolerably extensive and reliable.

What are the qualities, if any, that we are to regard as *racially* characteristic of Jews? Much vague declamation has been spoken and written on this subject. All the moral, social, and intellectual qualities of Jews have been spoken of as being theirs by right of birth in its physical sense. Jews differ from others in all these points, it is true, as I have partly shown elsewhere.² But the differences are due, in my opinion, to the combined effect of their social isolation and of their own traditions and customs, and if they have nowadays any hereditary predisposition towards certain habits and callings, these can only be regarded as secondarily racial, acquired hereditary tendencies which cannot be brought forward as proof of racial purity. If all the Johns and Maries of Europe were to be shut up in ghetti for a couple of centuries they would undoubtedly show peculiarities in habits and thought; they would develop a Johannine psychology, as it were, and most probably, as we shall see, a Johannine biostatics. And there is another reason why the psychological traits of Jews must be omitted for the present from any research which claims to be scientific. Science was to Condillac a hundred years ago only a well-constructed terminology (*une langage bien faite*); nowadays science is measurement accurately calculated. Now though I hope to show on some future occasion that the intellectual capacity of Jews, if not absolutely, is yet relatively measurable as compared with that of other Europeans, I should still hesitate to qualify these distinctions as racial in a strict sense. They seem more a matter of temperament, which is at best but the tone of race, and is much more modifiable by education and environment than

¹ I have reckoned in with the Sephardim the Italian Jews and those under Moslem rule.

² Vide my "Studies in Jewish Statistics" (*Jewish Chronicle* Office).

purely racial characteristics, so that it may happen that widely diverse races, *e.g.*, Jews and Frenchmen, may have much the same temperament. Under any circumstances it would be difficult for a Jew to avoid subjective bias in dealing with these matters, and where that bias leads to any assertion of superiority the result is as unsatisfactory from the point of view of science as it is from that of taste. It remains then to consider those qualities of Jews which depend on physical properties, and these have the further advantage of lending themselves to accurate measurement. These are (1) the vital statistics of Jews—marriages, births, deaths, diseases—and (2) their anthropometry or bodily measurements.

I. *Vital Statistics.*

As I have already given in my "Studies in Jewish Statistics" the results of my search among statistical publications on Jewish biostatistics, I will here content myself with giving a summary of the conclusions at which I have arrived. These are as follows:—¹

1st. Jews have a less marriage rate, less birth rate, and less death rate than their neighbours, but the less marriage and birth rate are due in large measure to the less mortality of Jewish children. The larger number of children living causes the percentages of marriages and births, really larger as regards adults, to seem smaller when reckoned on the whole population.

2nd. Jews and Jewesses marry earlier than the surrounding populations. Cousins intermarry more frequently, perhaps three times as often.

3rd. Jews have larger families, though fewer plural births. On the other hand, mixed marriages between Jews and persons of other race are comparatively infertile.

4th. In Jewish confinements there are more boys, less still-births, and fewer illegitimate births, though the advantage as to still-births disappears among Jewish illegitimate children.

5th. Jews have a smaller mortality of children under five, but this does not hold of Jewish illegitimate children, who die off at much the same high rate as the unfortunate beings of the same class in other sects. Jewish deaths over sixty are generally greater in proportion. Jews commit suicide less frequently.

6th. It has been frequently asserted that Jews enjoy an immunity from certain diseases, notably phthisis and cholera, but the evidence I have on this point is adverse to the claim. There is some indication that they are more liable to diabetes and hæmorrhoids, and they have certainly more insane, deaf-mutes, blind, and colour-blind persons.

¹ *Vide* my "Studies," No. VII, pp. 49 *et seq.*

7th. I would add two social facts of great importance in their bearing on vitality: (a) the vast majority of Jews live in cities; (b) Jews have a larger proportion of poor than the peoples among whom they dwell ("Studies," II and IV).

This long list of divergences between Jewish and general statistics might seem at first sight to imply strongly marked racial differences. But when closely examined, almost all of them are seen to turn on social characteristics. Thus the frequency of consanguineous marriages and the smaller proportion of illegitimate births and of suicides are clearly due to social causes. The same may be said of the earlier age at which Jewish marriages occur,¹ and from this follow their greater fertility, and probably the larger proportion of male births. Again, if less still-births and less mortality under five among their offspring were physical characteristics of all Jewesses, we should find them to some extent at least among illegitimate Jewish births and children.² But as a matter of fact the superiority is confined to legitimacy, and must therefore be attributed for the most part to social causes, the greater care taken of Jewish children, and of Jewish mothers. Thus we are left with only four biostatistical points which cannot be *prima facie* resolved into social phenomena, and may therefore be referred to influences of race. These are—(1) the less number of twins and triplets; (2) the infertility of mixed marriages; (3) the greater longevity of Jews; (4) their alleged special morbidity or liability to disease. The paucity of plural births we may dismiss, as nothing is known of the cause of these.

Infertility of mixed marriages deserves more attention, owing to its important bearings on the main question of this paper. As I may claim to have first drawn attention to the subject, I will here repeat the evidence on which I found it. In Prussia these marriages have been separately registered since 1875, and between that year and 1881 there were 1,676 such marriages, resulting in 2,765, an average of 1.65 to a marriage, whereas during the same period pure Jewish marriages resulted in an average of 4.41 children, or very nearly three times as many ("Zeit. Preuss. Stat.," 1882, p. 239). In Bavaria, between 1876 and 1880, 67 mixed marriages were registered, the resulting offspring being only 76, or only 1.1 per marriage, against 4.7 children to purely Jewish marriages ("Zeit. Bay. Stat.," 1881, pp. 188, 213). This conspicuous infertility also implies greater

¹ The earlier age of puberty may influence this, but I have shown the importance of social and religious causes in my "Studies," VII, where I attempt to connect this phenomenon with the fertility of Babylonian palms.

² F. J. Neumann was the first to use this crucial test (Brentano's "Jahrbuch," 1877).

sterility. Among 56 such marriages where I could ascertain the results, no less than 9 were sterile (18 per cent.), a striking contrast to the number of sterile marriages which I found in 71 marriages between Jewish cousins, where the percentage of sterility was only 5·4 per. cent. (*cf.* "Studies," p. 7). At the same time I must add that I found no other ill results. Of 85 families, only 2 were afflicted, about the same number as would be found among Jews in general, whereas 84 first cousin marriages included no less than 13 in which there were deaf-mutes or lunatics. The uniform infertility of mixed marriages can scarcely be due to any uniformity in the ages of the contracting parties, the chief determining factor of fertility, so that we may take it as a racial phenomenon, or, to make a rather fine distinction, as a phenomenon indicating racial differences.

The *longevity* and *vitality* of Jews are by no means so universally superior as has been thought; the superiority disappears in large measure among Jewish populations which, like those of Galicia and Russia, have a large proportion of day labourers.¹ So far as it is founded on the low death rate, it can be attributed rather to the greater care taken of children under five, which after all means that more weakly individuals are kept alive to carry on an unequal struggle for existence. It certainly would appear extraordinary if Jews enjoyed exceptional vitality, considering the insanitary conditions of their lives in the past, and their weakly constitution in the present. I have been able to obtain some details of the way in which they used to be overcrowded in the ghetti—

Place.	Date.	Jews.	Houses.	Average.	Authority.
Prague ..	1786	7,951	266	29·3	Ficker's "Bevolk. Böhmen," p. 55.
Frankfort ..	1811	2,214	159	13·9	<i>Times</i> , Aug. 8, 1884.
Prague ..	1843	5,646	279	20·3	Ficker, <i>ibid.</i>

And Tchubinsky reports that in 1840 the Jews of Southern Russia used to dwell thirteen in a house, whereas the general population had only from four to five ("Globus," 1880, p. 340). So, too, the military statistics show an extraordinary number of individuals who are unsuitable for military service owing to their weakly constitution (*cf.* Goldstein's paper in "Revue d'Anthropologie," July, 1884). And where any superiority in vitality is

¹ *Cf.* Bergmann, "Beiträge," 1883, pp. 145-6.

shown, this again may be traced to moral and social causes. Jews do not lead "dangerous" lives in the insurance sense (sailors, soldiers, firemen, miners, &c.). The trades which they do exercise, except that of tailoring, seem more long-lived.¹ Further, the Jewish nature does not seem to require stimulants, and Jews are markedly free from alcoholism. The tranquilising effects of Jewish family life, the joyous tone and complete rest of the Sabbath and other festivals, the unworrying character of the Jewish religion, are all important in the difficult art of keeping alive. The greater care taken of Jewish women, who more rarely take to manual labour, aids also in producing good results in the tables of mortality. I attribute much importance, too, to the strict regulation of the connubial relations current among Jews.²

I am unable to attribute much beneficial influences to the Jewish dietary laws, though the matter requires careful and unbiassed examination. These may be divided into four divisions, developed in chronological sequence—(1) the Biblical distinction of clean and unclean (Lev. xi); (2) the Talmudic method of cutting the animal's throat (*Shechita*) for the purpose of removing the blood; (3) *Bedika*, or examination of the chief organs to see if there are any lesions, developed after Talmudic times; (4) *Melicha*, or putting the flesh into salt and water to remove the blood; the origin of this is uncertain, nor is it clearly mentioned in the Talmud. It may have some connection with the practice of using salt with sacrifices (Lev. ii, 13). (1) The diet prescribed by the Bible, as by all Oriental legislation (Manu, Zoroaster), was doubtless due to a rough induction from popular experience. Apart from a few anomalies,³ it coincides in the main with the dietary of all civilised peoples with whom the ruminants, being the chief domestic animals,

¹ The indefatigable Korösi has given from Schimmer statistics showing that while 37 per cent. of Catholics (over 14 in Buda Pesth) followed certain trades of high mortality, and Protestants about 33 per cent., Jews had only 22 per cent. in these industries ("Pest in 1870," p. 45).

² Query: may this custom of separation (Lev. xv, 19) have any connection with Jewish proficiency in music, which in its origin seems to be also regulated sexual emotion? (cf. Darwin, "Descent," p. 573, and Gurney, "Power of Sound," chap. vi, pp. 116-121).

³ It is possible that some of these anomalies may be explained as survivals of totem worship derived by the ancient Hebrews from the Canaanites, or existing among themselves. Even in Ezekiel's time the Jews worshipped "every form of creeping thing and abominable beasts" (Ezek. viii, 10), and it has been contended that they worshipped totems, and no member of a totem clan will eat the totem animal. When, therefore, we find in the same passage Jaazaniah ben Shaphan (i.e., son of the Coney or Rock-badger) in the same passage (verse 11) officiating at these totem-rites, totemism is given as the reason why the coney was included among the taboo'd food of the Israelites (Lev. xi, 5). On the whole subject cf. Prof. Robertson Smith, "Journal of Philology," 1880.

form the staple diet. The chief exception is, as is well known, the use of pork. This has been found to be injurious in hot climates, but in northern latitudes the chief danger has been found to be from trichinosis. So far as this affects vitality, Jews are undoubtedly free from this source of danger, but it scarcely seems to be prevalent enough to affect the death rate. (2) *Shechita* seems to have been originally confined to animals intended for sacrifice on the principle that "the blood is the life," and that this must be entirely spilt. It was afterwards extended to secular food, and it is nowadays contended that the removal of the blood is a safeguard against waste-products contained in it. Whatever advantages this gives must also be enjoyed by Mohammedans, who have borrowed it, as well as the Biblical distinction between clean and unclean, from the Jews. As a matter of fact, it does not remove all the blood, since Jewish practice requires a further process, insertion in salt and water (*Melicha*), to ensure this. (3) The *Bedika*, or examination of the internal organs, seems based on a correct principle,¹ but it has never been ascertained how far this is carried out in practice; it certainly does not ensure immunity from tubercle, as we shall shortly see. (4) About this it is sufficient to say that it does not effect its purpose. The originators of these practices, I may add, did not claim any medical validity for them, carefully distinguishing cases where food should not be eaten for medical, as opposed to religious, reasons. Some Jewish writers have even declared the flesh of the swine to be highly nutritious (*cf.* Kalisch on "Leviticus," II, p. 82).

These practices certainly do not secure *immunity* from any special diseases, as has been claimed for them in recent years, especially as regards cholera and phthisis. We now know that the Jews fell victims to the Black Death as much as their neighbours (Hœniger, "Der Schwarze Tod in Deutschland," 1881). As regards cholera, the only favourable result I can find is a strong tradition that Jews suffered less from it when it visited England in 1834, and last year at Marseilles their death rate from it was only 2 per 1,000, against 5 of the general population ("Vessillo Israel," September, 1884). On the other hand, I find in 1873 the mortality from cholera in Hungary greatest where there were most Jews, *e.g.*, 63 per 1,000 in Drohobycz, where half the inhabitants are Jews ("Statist. Monatsft," 1875, p. 136). In Smyrna, 1848, mortality from this pest carried off 1 in 26 among Jews, 1 in 40 among Moham-

¹ It is scarcely likely, however, that the Rabbins were in any sense anticipators of Koch and Pasteur, for they considered the function of the lungs to be to absorb the liquids of the body. See Talm. Bab., Beracoth 60 a, a passage which shows them to be by no means in advance of Hippocrates and Galen.

medans, $\frac{1}{3}$ Greeks, $\frac{1}{8}$ Catholics, $\frac{1}{10}$ Armenians (Burguière's "Etudes sur la Cholera à Smyrne," Paris, 1849, in A. Hirsch "Hist.-Geog. Pathologie," 1st edit., I, 129); and Bonnafort noticed the same for Algiers (*ibid.*), and Lombroso for Verona (Legoyt, "Immunités," p. 65). The alleged immunity from tubercular disease disappears in the same way on reference to definite results.¹ In Verona, 1855-64, Lombroso found among 272 Jewish deaths 6 per cent. from phthisis, against 7 per cent. among Catholics, and in an Hungarian district Glatter found this disease (*Lungentuberculose*) causing 14·4 per cent. of 473 Jewish deaths, against 16·9 Magyars, 16·4 Slovaks, and 19·5 Servians, but against only 13·5 of German deaths,² (Casper "Vierteljahrschft.," XXV, p. 48). These are the only favourable statistics, and by no means exceptionally so. Here in London, of 1,215 deaths attended by the medical officer of the Jewish Board of Guardians 1862-71, I have found that no less than 159 were due to tubercular disease, 13·1, against 11·3 for the Whitechapel district for the same period (Registrar-General's Report, XXXV, Suppt., p. 37). I find phthisis especially prevalent among Jews in Egypt according to Pruner, in Algeria according to Haspel, Bertheraud, and Pietra Santa (Hirsch, II, 95), and in South Russia according to Tchubinsky ("Globus," 1880, p. 377). Strong confirmatory evidence of the last statement may be seen in the fact that among the Russo-Jewish recruits of 1877-8 no less than 4 per cent. were dismissed for phthisis (a disease that cannot be "malingered"), against only 1·3 of the Polish recruits (Goldstein in "Revue d'Anthrop.," 1884, p. 470). We cannot therefore, in the face of these facts, claim any immunity from phthisis for Jews. No claim has been made for freedom from zymotic diseases; such immunity would be but a doubtful boon, as it would only leave freer field for the demon Bacillus to batten on, and the same might be said of the alleged immunity from phthisis. Syphilis seems to be less prevalent among Jews;³ but this may be due to moral causes,

¹ On this see Dr. H. Behrend, "The Communicability of Diseases of Animals to Man" (*Jewish Chronicle* Office). Unfortunately, Dr. Behrend has undertaken to show why the practice of *Bedika* should produce immunity from phthisis before ascertaining whether the immunity exists. And certainly he proves too much in the pamphlet referred to when he points out that 80 per cent. of animals slaughtered are infected with tuberculous disease. For only about 42 per cent. are rejected by the Jewish butchers, many of them merely for faults in the mode of slaughter.

² On the other hand, Jews had 4·7 of deaths from tubercular cerebral inflammation, against 2·2 Serbs and Slovaks, 2·6 Magyars, and 1·5 Germans.

³ Dr. A. Cohen, late Senior House Surgeon of the Metropolitan Free Hospital, has kindly given me the following details of the venereal cases coming under his notice during hospital practice in 1882-3. The numbers are those of all the venereal cases; the percentages in the first two rubrics, those of syphilitic cases;

and in so far as it is the result of circumcision¹ it is clearly not racial. The smaller proportion of congenital cases follows from this, and is thus only secondarily racial.

But if we cannot claim for Jews any racial immunity from special disease, neither can it be asserted that they are liable as a race to any, such as hæmorrhoids and diabetes. So far as these are prevalent among Jews they are due to sedentary habits. Even the most widely spread of Jewish diseases, insanity, blindness, and deafmutism, can be traced in part to their life in towns, their mental activity, and exciting occupations. With regard to deafmutism, I am inclined to lay some weight on an explanation which is nowadays thought to be exploded, viz., the influence of consanguineous marriages (*cf.* "Studies," p. 8, and *supra*, p. 28). Thus on examining some 28 families of children at the Jews' Deaf and Dumb Home, Walmer Road, I find that families where the parents are unconnected have 1·2 mutes per family, those where the parents are second cousins 1·5, and where the parents are first cousins there is an average of 3 mutes per family. The numbers are too small to enable us to draw definite results, but they suggest the need of further inquiry into this point.

Thus throughout our review of Jewish biostatics we have failed to find any phenomenon which was uniformly present in all Jews that could not be referred to social causes. No doubt there is reciprocal influence between nurture and nature, and the Jewish organism may show some traces of the beneficial influence of Jewish training, as it certainly shows traces of the

the complementary ones would give those of gonorrhœa. The percentage relating to children are those of congenital syphilis observed in the number of children examined.

	Men.		Women.		Children.	
	No.	Per cent.	No.	Per cent.	No.	Per cent.
Jews	122	17·8	10	20·0	153	3·3
Others	539	62·0	192	62·6	367	15·8

The number of Jewesses affected altogether was too small to afford trustworthy results. The proportion of Christian to Jewish patients was about three to one, the hospital being in the centre of the Jewish quarter of London.

¹ No investigation of the effects of this very widely spread custom (*cf.* Andree, "Arch. f. Anthr.," xiii, pp. 53-78; Ploss, "Das Kind," I, pp. 342-372) on venereal diseases has been made. It certainly does not produce immunity from gonorrhœa, which is mentioned both by Bible (Lev. xv, 2) and Talmud (Bergel, "Medizin des Talmuds," p. 40). On the possibility of an Egyptian origin of circumcision see Welcker in "Archiv. f. Anthrop.," x, p. 123. The phallus examined was of the fifteenth century B.C.

ill-effects of the environment in the bodily measurements to which we shall soon turn. But these influences are, in the first instance, social, not racial, and *cannot therefore be adduced to show common origin*. If we may restrict the word "Jewish" to properties due to the origin of Jews, and "Judaic" to whatever is due to their religion or customs, we may say that their biostatics is Judaic, not Jewish. To revert to our original illustration, if the Johns and Maries whom we imagined cooped up in ghetti had married as early, treated their children as tenderly, if the Johns had nurtured the Maries as well, if they had had the same pleasing family life and care of poor by rich, as Jews, they would have developed a Johannine biostatics largely resembling the Jewish. But these Johannine qualities would not be due to common origin, and would therefore be what I have termed "secondarily racial," and so it *may be* with Jewish qualities. So far as Jews enjoy certain vital advantages over their neighbours these depend on the simple antique virtues and customs of the Jews and Jewesses of past and present. These advantages will persist as long as the virtues remain, and disappear, as in some respects they are disappearing,¹ when the bonds of religion and tradition are relaxed.

We turn then in our search for purely racial characteristics of Jews to the measurements of their outward qualities, to their

II.—*Anthropometry.*

It might seem impossible that we should be disturbed here by having to consider any social factors. Yet, as regards two important sections of anthropometry—height and girth—social considerations have great weight, and, indeed, it would not be impossible to show their influence on colour-blindness, on the shape of the skull, which alters with increased mental activity, and perhaps even on the colour of the hair and eyes, which are not, in the long run, independent of quality and quantity of nutrition. But, on the whole, we may neglect these disturbing causes and take the following measurements as distinctive of the Jewish race at the present day, leaving for later consideration the question how far they indicate purity of race.

Height and Girth.—Jews are nowadays the shortest and narrowest of Europeans (excepting, perhaps, Magyars as regards the former), as the following sets of measurements will show:—

¹ The rate of illegitimacy and of suicides has been rising while the death rate is rising relatively to the surrounding populations, and the excess of male births is falling.

No.	Country.	Height.	Span.	Girth.	Authority.
6592	Poland ..	161·2	..	80·1	Snigerew, "Revue d'Anthrop.," 1884, p. 470.
4372	" ..	161·1	..	..	Uke, in Andree, "Volkskunde," p. 32.
826	Galicia ..	162·3	..	79·4	Majer and Kopernicki, "Charak, Fizyck, Galic," pp. 37 and 59.
810	Hungary	163·3	..	..	Scheiber, "Arch. f. Anthrop.," xiii.
130	England	170·8	..	89·5	Jacobs. ¹
100	Russia ..	162·7	168·1	84·2	Blechnmann, "Anthropologie."
72	Various ..	163·2	..	84·6	Weisbach, "Körpermess."
20	Russia ..	163·7	170·7	..	Schulz, from Blechnmann.

In the British Association Report for 1883 there is a list of heights of eighty-five different races, among which English Jews come thirteenth with 169·2 cm., and Polish Jews, according to Majer and Kopernicki, as low down as seventieth. Again, in a list of 122 racial heights by Weisbach ("Novara Expedition," pp. 216-217), Jews come seventy-sixth with Schulz's measurement, and would be much lower down with 162·1 cm., the mean of the above 12,922 measurements.

I may mention that the Jews measured for the British Association were of the higher social grades, and their superiority over the other Jews is undoubtedly the result of better nurture. The smaller height of Jews may thus be partly due to their residence in cities ("Brit. Assoc. Report," 1883, p. 284); tailors are also the smallest of men, and a much larger proportion of Jews are tailors. Goldstein has determined from Snigerew's measurements that Russian Jews have a smaller chest-girth, both absolutely and relatively, than other Russians, and he therefore credits them with a less "index of vitality." ("Revue d'Anthropologie," 1884, p. 481.) Other bodily measurements have been too sporadic for record, being limited to 19 examined by Weisbach, 20 by Schulz, and 100 by Blechnmann.

Craniometry.—The few results reached in this branch of anthropometry seem to show that Jews are predominantly brachycephalic, and are not physically long-headed. Only thirty-four skull measurements are given by Stieda ("Arch. f. Anthrop.," xiv, 68) from Pruner-Bey, Welcker, Davis, Weisbach, and Dusseau: these give an average index of 77·3. To these I would add fifteen given by Lenhossék ("Cranioscopia," p. 167), with an index of 80·5, and five of Italian Jews, which I calculate

¹ From the measurements made for the British Association by Dr. M. Davis, who kindly lent me the results.

from Legoyt (*"Immunités,"* p. 66) to have the same index. All the fifty-four skulls would therefore give a mean index of 78·5, more meso-cephalic than otherwise. But the larger number of measurements on the living subject give results as follows:—

No.	Index.	Dolicho-	Meso-	Brachycephalic.	Observer.
67	82·2	19·4	26·9	53·7	Dybrowski.
100	83·2	3·0	11·0	86·0	Blechnmann.
313	83·5	4·8	10·9	84·3	Kopernicki.
380	83·4	8·1	16·6	75·3	Average.

With the larger numbers the brachycephalic character of the Jewish head seems to come out very distinctly. It is to be observed that Majer and Kopernicki considered that the ooidal head went with blonde hair, the brachycephalic with dark; but the number of long heads examined by them was small (fifteen) and Blechnmann found one of his dolichocephalic subjects with dark hair. He also asserts, without a particle of evidence, so far as I can see, that Sephardic Jews are dolichocephalic. Dr. Beddoe, indeed, states that Ashkenazim have mostly "ooidal" heads, but the above statistics only show how untrustworthy mere impressions are, even when those of a trained observer.

Hair, Eyes, and Complexion.—Here we reach somewhat more definite results, based upon nearly 120,000 measurements I have collected in the table on the following page.

From these figures we see that though Jews are darker both in eyes and in hair than any of the other nationalities, they have about 21 per cent. blue-eyed and about 29 per cent. blonde-haired, and have thrice as many red-haired individuals as either Poles, Russians, or Austrians, and half as many again as Germans. It may be remarked that anthropologists are inclined to consider dark-haired races better fitted for the struggle for existence (F. Galton, *"Record,"* p. 8; Schimmer, *"Erhebungen,"* p. xxiv). The significance of these results as regards the question of purity of race will concern us later. Meanwhile I would supplement the above list by one compiled by me from Dr. Beddoe's results in his paper *"On the Physical Characteristics of the Jewish Race"* (Ethnol. Trans., 1869).

These were the first published on the subject, and differ slightly in arrangement from the above, which mostly follow Virchow's epoch-making investigations into this subject. Dr. Beddoe examined 665 individuals in different places, and by taking the Jews of Turkey, Rome, and the Sephardic congregation

Place, Number, and Authority.	Race.	Eyes.			Hair.				Skin.
		Blue.	Grey.	Brown.	Blonde.	Brown.	Black.	Red.	
I. <i>Austria</i> (59,808 Jews, Schimmer, "Erhebungen," 1885)	{ Jews .. { Austrians ..	23.5 34.3	30.6 33.4	45.9 32.3	27.0 44.9	55.4 49.2	16.9 5.6	0.6 0.2	65.4 82.3
II. <i>Prussia</i> (c. 50,000, Virehow, "Zeit. f. Ethn.," 1876, p. 17)	{ Jews .. { Prussians..	18.7 43.0	28.8 32.7	53.5 24.3	32.4 72.2	55.5 26.1	10.1 1.2	0.5 0.3	77.7 93.5
III. <i>Bavaria</i> (7,054, Mayr, "Zeit. Bay. Stat.," 1876)	{ Jews .. { Bavarians	20 29	31 37	49 34	30 54	50 41	20 5	.. ..	70 85
IV. <i>Buda Pesth</i> (3,141, Korösi, "Ann. de Demog.," I, p. 137)	{ Jews .. { Hungarians { Germans..	18.3 29.0 29.3	24.2 25.9 30.6	57.5 45.1 40.1	23.7 50.7 55.4	57.0 45.4 38.9	19.3 3.7 5.7	.. .. ..	67.3 77.9 78.4
V. <i>Württemberg</i> (1,995 Frass, "Centralbl. Anthropol.," 1876, No. 12)	{ Jews .. { Württem.	20 32	28 33	52 35	31.5 61.8	57.0 36.0	10.6 1.6	0.9 0.6	....
VI. <i>Galicia</i> (826, Majer and Kopernicki, <i>loc. cit.</i> , pp. 88, 180)	{ Jews .. { Poles .. { Ruthenians	23.0 34.0 31.5	24.1 46.9 19.6	52.9 29.1 38.7	23.2 45.0 31.9	53.7 49.5 54.2	13.1 5.5 13.9	4.5 1.2 1.4	66.4 39.9 59.9

¹ Virehow does not give number of Jewish children, but as there were 4,127,766 in all, and Jews are 1.3 per cent. in Prussia and have more children, they cannot have been much less than 50,000.

² Adding blue to green and chestnut to brown to make the results uniform.

These results must be taken with the restriction that, as the Anthropometric Committee of the British Association point out (Report, 1883), the hair and eyes of schoolboys' grow darker as they grow older.

of London as Sephardim, I am enabled to give some data for distinguishing between Sephardim and Ashkenazim as follows:—

	Eyes.			Hair.				
	Light.	Neutral.	Dark.	Red.	Fair.	Brown.	Dark.	Black.
290 Seph.	20	12	68	3·5	3·5	15·7	40·0	37·3
375 Ashk.	27	14	59	1·1	2·6	17·0	45·6	32·7

The differences are not very striking, with one remarkable exception: Sephardim have three times as many red-haired as Ashkenazim.

Colour-blindness may be taken here, though perhaps belonging to morbidity. The following table exhibits the chief results hitherto obtained, which are practically decisive of Jewish inferiority in this respect, due doubtless to the greater poverty of Jews and their long confinement in towns:—

No.	Place.	Jews.	Others.	Authority.
814	Breslau ..	4·1	2·1	Cohn, "Centblt. Augenkunde," 1873, p. 97.
949	London (boys)	4·9	3·5	"Trans. Ophth. Soc.," I, p. 198.
730	" (girls)	3·1	0·4	<i>Ibid.</i>
500	Frankfort ..	1·8	2·9	Carl, "Untersuchungen," 1881.
500	Italy (boys) ..	2·9	2·7	Ottolenghi, "Gaz. Cliniche," 1883.
420	" (girls) ..	0·0	..	<i>Id.</i> , "Vessillo Israel," Sept., 1884.

Ottolenghi, from whom I take Cohn's and Carl's results, observed that three out of his thirteen cases were cousins, two of whom had a maternal grandmother also colour-blind. The Ophthalmological Society's results were obtained from the poorly nurtured children of the Jews' Free Schools, Bell Lane and Greek Street.¹

Nose.—This feature is the one usually regarded as distinctive of the Jew, and is also considered anthropologically important (Topinard, "Anthropology," p. 358). I therefore give the few data I can gather as to its length and shape. Weisbach's nineteen Jews vied with the Patagonians in possessing the longest nose (71 mm.) of all the nineteen races examined by him (Andree, "Volkskunde," pp. 32, 33), while they had at the same time the narrowest noses (34 mm.). Blechmann's century of Jews, on the other hand, had an average length of 51·9 mm., and breadth

¹ Query: may the colour-blindness of Jewish girls account to any extent for their choice of primary colours for dresses?

35·9, giving a nasal index of 69·6 ("Anthropologie," p. 33). As regards shape, his results are—2 short, 10 broad, 2 *retroussé*, 4 flat, and 84 straight, while Majer and Kopernicki give the following table (p. 187):—

		Poles.	Ruthenians.	Jews (742 in number).
Curved-aquiline	..	6·4	6·1	30·9
Straight	..	67·4	68·1	59·6
Flat	..	7·5	11·2	2·9
<i>Retroussé</i>	..	18·7	14·6	6·6

But that one saw it "in print," most persons would doubt the possibility of meeting Jews with noses "tiptilted like a lily."¹

Lips are another characteristic feature of Jews, but the only measurements I know of are those of Blechmann, who gives 54 thin, 31 moderately thick, and 17 thick ("Anthrop.," *loc. cit.*), a result rather opposed to one's preconceived notions about the thick lips of Jews.

Expression.—Turning from the separate features of the Jewish face to that combination of them which we term expression, it might seem impossible to give anything more than subjective impressions. Thanks, however, to Mr. Galton, science has been enabled to call in the aid of photography to obtain those averages which no measurements can supply. Some two years ago I applied to him to know whether he would assist me in obtaining composites of Jewish faces, and to this he was kind enough to consent. A number of photographs of Jewish boys were taken at the Jews' Free School, through the kindness of Mr. Angel, the well-known head-master of that admirable institution, and Mr. Galton was good enough to compound them in the way familiar to all here (*vide* F. Galton, "Inquiries into Human Faculty," App. B, III). Plates I and II contain a number of the results, together with the individual components from which they were compounded.² It will be observed that in the composite (C) containing the largest number of components (thirteen) the face has distinctly what is termed a Jewish expression, though it is full-faced. It follows that the peculiar expression known as Jewish cannot be due to the droop of the nose alone. The full lips, the heavy eyelids, and large irides have much to do with it. So far as the nose is concerned it is the flexibility of the *alæ*, or wings

¹ Harim (1 Chron. xxiv, 8) and Harumaph (Neh. iii, 10) were flat-nosed if their names do not belie them. Roven Salomo, a Jew of 1347, figured in "Revue d. Études Juives," No. 12, has a distinctly concave nose.

² See explanation at end of paper, p. 53.

of the nostrils, that are distinctive rather than its curvature.¹ I may add that an artist friend has pointed out to me that a figure 6 with a long tail gives the best caricature outline of the Jewish nose, and here again the importance of the *alæ* is manifest. In the profile co-composite (G) containing ten Jewish noses rolled into one, it will be noticed that the outline is blurred, i.e., not typical, while the accentuation of the *alæ* is clearly marked, and lips and chin are tolerably distinctive. The actual expression in the various composites varies to some degree, and it is a doubtful point whether the peculiar intensity of the Jewish gaze (well exhibited in composite D) is not due to long residence in ghetti and the accompanying social isolation. I fancy at least that it disappears to a large extent in Jews who pass very much of their life among Gentiles. At the same time something like it may be traced throughout the history of Art, and I may refer to one of the earliest representations of Jews in Art, the Assyrian *bas relief* of the captive Jews of Lachish (B.C. 701) being taken before Sennacherib (see Sayce, "Fresh Light," p. 145). The subject is undoubted and well known, and the persistency of the Jewish type for the last 2,600 years is conclusively proved by it. But a careful examination shows that the Assyrian artist gives the Jewish captives very much the same type of face as their captors, the chief difference consisting in the fact that the Jews have the beard cut, the usual sign of captivity. The female slaves behind Sennacherib's throne might have been taken from the synagogue galleries of to-day, and yet we have no warrant that they are Jewesses. The *relief* then shows not only the persistency of the Jewish type, but its practical identity with the ordinary Semitic type of those days. I possess a photograph which shows the same at the present day: I bought it thinking it to be a collection of Eastern Jews, and found out afterwards that it was a *séance* of Syriac Mohammedans.²

III.—Historical Data.

And this leads me to the main subject of this paper—the question of the purity of the Jewish race. M. Renan, who re-

¹ Query: may this aid histrionic expression? George Eliot gives the Alcharisi, "a play of the brow and nostril which made a tacit language" ("Dan. Deronda," p. 4:9).

² Before leaving the anthropometric data I should have referred to the earlier age at which menstruation appears among Jewesses. Raciborski, "Traité de la Menstruation," 1869, p. 630, puts it at 14 years 3 months and 25 days, which would place them earliest in Topinard's scale ("Anthrop.," p. 366), except for Southern Asia. Cf., too, Ploss, "Das Weib," i, 148. The matter requires further investigation.

cently expressed his regret that he did not give his youth to science, as he would have certainly anticipated Darwin, has made his first incursion into scientific fields in an examination of this question ("Le Judaïsme comme race et comme religion," Paris, 1883). His results are mainly against the racial purity of the Jews, and in this conclusion he has been followed by M. Isidore Loeb in an excellent article, *Juifs*, in Saint Martin's "Dictionnaire de Géographie," and we have just heard how Dr. Neubauer upholds the opinion of his illustrious friend. Notwithstanding the authority which must attach to such names when dealing with a matter mainly historical, I hope to show that the last word has not been said on the subject, and that anthropological science in particular has certain considerations to suggest which must give us pause before accepting the conclusions at which these authorities have arrived. The whole question is very complicated, and I will attempt to give the strongest arguments on both sides, beginning with those unfavourable to the purity.

(1) *Proselytism*.—The question of the former intermarriage of Jews and Gentiles resolves itself into that of proselytism, since Jewish law does not recognise *matrimonium* with a person of another belief.¹ But in the early days of Israel this was not the case. After the conquest of Canaan, the Israelites entered into frequent connubial relations with the conquered. We may perhaps see a reference to the beginning of this process² in the curious tradition about the Judge (or Baron) Ibzan of Bethlehem who, we learn (Jud. xii, 9), "had thirty sons and thirty daughters: the latter he sent abroad and took in thirty daughters from abroad for his sons." But such intermarriage with the daughters of Canaan are of little significance from the anthropological point of view.³ For there was no such diversity of type among the Semites as among the Aryans. The Semitic languages differ from one another only as the Romance tongues do, and do not show such wide differences as those between Russian and Welsh. We have already seen that Jews and Assyrians of the eighth century B.C. were of practically the same type. The distinction between Jews and other Semites was religious, not racial. The strenuous prohibition of Ezra against marriage with strange women was directed against idolatry rather than exogamy. For even before this date we

¹ *Vide* Frankel, "Grundlinien d. mos. Eherechts," p. 22, and Ritter, "Philo," p. 71. Philo makes the prohibition even stronger, taking Deut. vii, 3, as binding with regard to all nations.

² Query: was this a case of exogamy with other Israelite totem-clans? (*cf. supra*, p. 29, note.)

³ Jewish tradition recognised Ammonites, Moabites, and Idumeans to be of same race (*cf.* Wellhausen, art. *Israel*, "Ency. Brit.," "History," p. 429).

find traces of proselytism in the Bible.¹ The second Isaiah (lvi, 6) speaks of "the sons of the stranger who join themselves under the Lord." The late book of Esther also refers to proselytes (viii, 17; ix, 27), while three of the later Psalms (Ps. cxvii, cxviii, cxxxv), possibly of the second century B.C., divide Jews into three classes—"the House of Israel," "the House of Aaron," and "those who fear the Lord." The last became the technical expression for proselytes among Hellenistic Jews (Acts, *passim*). So numerous had these proselytes become that they were classified according to the motives which led to their conversion. There were Proselytes of the Lion—from fear; Proselytes of the King's table—from ambition; Proselytes for a wife; and there was a grand division made between Proselytes of the Gate, who did not observe the most stringent of the Mosaic regulations, and Proselytes of Righteousness, who were even as Jews in all that concerned the Mosaic precepts. Now it is only with the latter class that we are concerned, since only these had the full *jus connubii* with persons of Jewish race and religion. It is therefore of critical importance to know whether any of the many proselytes mentioned by Josephus, the New Testament, and the Talmud were proselytes of the Gate or of Righteousness, the latter being the only ones that affect the main question. The Jews of Antioch only made the many inhabitants proselytes "after a fashion" (τρόπων τινί, "Wars," VII, iii, 3), i.e., they were only Proselytes of the Gate. I am surprised to find a scholar like M. Renan omitting this cardinal restriction, which tells dead against his position.² St. Paul, in his addresses to the congregations at Antioch (Acts xvii, 16, 26), Thessalonica (xvii, 4), Athens (*id.*, 17), carefully distinguishes Jews and proselytes. And in a significant passage ("Wars," VI, ix, 3), the bearing of which has been overlooked by M. Renan and his followers, Josephus mentions that the foreigners who came to worship at Jerusalem

¹ For many of the following facts I am indebted to J. Bernays' masterly essay, "Die Gottesfürchtigen bei Juvenal," in the Mommsen presentation volume, and now reprinted in his "Gesam. Schrift.," ii, 71-80 (*cf.* Mayor's "Notes on Juvenal," xiv, 99, *et seq.*).

² M. Renan translates *Ayant amené à leur culte un grand nombre d'Hellènes ils en firent une partie de leur communauté* ("Le Judaïsme, &c.," p. 72). He should have added to the last clause some such phrase as *tant bien que mal*. Similarly in the translation of C. Apion ii, 39, M. Renan (p. 15) has not quite preserved the force of the Greek πολλά, which shows that the Greeks and barbarians referred to did not observe all the Jewish dietary laws, and were therefore not full proselytes. As a matter of fact they were not proselytes at all, nor does Josephus say they were. He is referring to the well-known fact that many other nations have customs similar to the Jews, e.g., the Sabbath or dietary laws and with his usual boastfulness pretends that they learnt them from the Jewish law. Only the fact that M. Renan intended his discourse for a conversation (p. 1) can excuse these slips.

were not allowed to share the Passover meal, *i.e.*, were only proselytes of the Gate. When Josephus calls Nero's wife, Poppæa, a proselyte (*θεοσέβης*), this can only mean that she was interested in Jewish doctrines: it cannot imply any adherence to Jewish customs. It was to this very class of proselytes of the Gate that Paul appealed, and founded Christianity by granting full religious rights to them. The triumph of Christianity meant, therefore, that this rapidly growing class were drawn off from Judaism to the new sect before they had been fully incorporated with the older body. After the wars with the Romans Jewish propagandism would have but little scope, as, indeed, M. Renan allows. So that for the existence of full proselytes during this period we have only the evidence of Juvenal, Dio Cassius, and Tacitus, who might easily be struck by a few examples of what they considered a barbarous custom.¹ The last says that Jews never intermarried ("Hist." v. 5).

So soon as Christianity became the State religion, proselytism would become dangerous. Severe penalties were placed by the laws against intermarriage of Jew and Christian, which was placed on the same footing as adultery (390 A.D., "Cod. Theod.," LV, ii).² The Councils of the Church included similar injunctions as a matter of course, one set of canons following the preceding.³ The severity of the sentence is often enough to show how rarely the laws were transgressed. This, however, if any, was the time when any intermarriage could have taken place, owing to the kindly relations of Jews and Christians. Unfortunately, it is also the time (300 A.D.—800 A.D.) of which we know least about Jews. Before, however, we reach Charlemagne's epoch two instances of proselytism on a large scale occurred in the countries beyond civilisation, and these have naturally been emphasised by M. Renan and his followers. In South Russia the kingdom of the Cozars,⁴ situated midway between the Patriarchate of Constantinople and the Emirate of Bagdad, ingeniously evaded the necessity of acknowledging either of these powers by formally adopting Judaism, which both had to tolerate. The adhesion was scarcely more than

¹ See M. Derenbourg's temperate and judicious treatment of the question, "Essai," chap. xiv. With regard to converts at the Imperial courts (Graetz, "Die jüd. Proselyten," 1884), it is a great question whether for "Jewish" we ought not to read "Christian." I see an instance of this in Epict., "Disc.," II, ix.

² Constantine appointed the punishment of death against such marriages ("Cod. Theod.," xvi, 6).

³ Elvira (320), xvi; Chalcedonia (388), xv; Third Orleans (538); Maçon (581); Third Toledo (589), xiv; Fourth Toledo (633), lxiii. Basnage, "Histoire," ix, 409-414.

⁴ St. Martin, "Les Khazars," 1851. Harkavy, in "Russ. Revue," 1876. For Arabic and Hebrew sources, see Carmoly, "Itinéraires de Sainte Terre," 1847.

formal, and there is little evidence of any great intermixture of pure Jews with these Cozars, except by the few learned Jews who taught them their creed.¹ These seem to have been of the Karaite sect, and we find still the headcentre of the Karaites in the Crimea, where the Cozars ultimately concentrated. All accounts represent the Karaites as perfectly un-Jewish in appearance, and I would venture to apply to them Napoleon's witticism, "*Grattez le Karaite et vous trouverez le Khazar.*"² The Cozars were crushed in the ninth century, while the Polish Jews, who are supposed to show signs of intermixture with Cozars, came into that kingdom from Germany long afterwards. Similarly, a somewhat earlier conversion of Arab tribes in Yemen has only left traces on contemporary Judaism in the Falashas, to whom Rohlfs also denies Jewish features ("*Abessinien*," 1884, p. 273). Karaites and Falashas, with the Daggatouns of the Sahara and the Beni-Israel of Bombay, are the only Jews of to-day who display alien blood, and these form only one per cent. of Israel, and never intermarry with Jews.

After the age of Charlemagne no great intermixture of Jews and Aryans can be discerned. As Europe became Christendom, the Church isolated the Jews more and more by cutting them off from the trade guilds, originally religious, and from all civil rights: they became the King's chattels in a literal sense. The mere fact of their being cooped up in ghetti would be enough to put a bar in the way of frequent intercourse, and it was the true insight of an artist that made Sir Walter Scott regard a marriage between Rebecca and Ivanhoe as rendered impossible by the circumstances of the Middle Ages.³

To sum up this short sketch of Jewish proselytism, this undoubtedly existed before the spread of Christianity, but only or mainly so far as Proselytes of the Gate were concerned, who could not marry with Jews, and these were soon intercepted by the Church, which afterwards took most stringent measures to prevent any relapse. I would add that the case is somewhat different as regards slaves, and it is possible that some infusion of Aryan blood came in through this means, but the amount

¹ There were only 4,000 Jewish Cozars in all (Frœhn, "*De Chazaris*," 1822, p. 13). But to the contrary effect see Masudi, "*Meadows of Gold*," p. 407. The letters interchanged between the Khan of the Cozars and R. Hisdai of Spain, serve to show the rare intercourse of the Cozars with the rest of the Jewish world.

² M. Renan makes much of a Karaite being named Toktamish. This might be explained by his being a Cozar. But Jews have always freely adopted local names (Zunz, "*Namen der Juden*"). Cf. Talw. Jer., Gittin i, 55 b.

³ Though the name *ghetto* is derived from the foundry at Venice, in which Jews were cooped up in 1510, the thing existed as early as 1090 at Salerno, if not earlier at Constantinople (Graetz, v, 37), or even in Rome and Alexandria.

would be necessarily small; and the children, according to Jewish law, followed the *status* of the mother.

The above estimate of Jewish proselytism is substantiated by all the evidence I can gather on the subject. Thus while of the 200 doctors of the Mishna up to 200 A.D., no less than eight¹ were of alien blood (though that Semitic), of the 1,500 doctors of the Gemara, from 200 to 600 A.D., I can only find one (Mari bar Rahel)² who seems to have been descended from a proselyte. This seems to indicate the dying out of proselytism after Christianity, though the change of scene from Palestine to Babylon may have also something to do with it. Rava and Nachman, two Babylonian Rabbis of the fourth century, in discussing a certain law, dismiss the case of a proselyte as it is so seldom (Gittin, 85 a). So, too, on looking through some eight hundred inscriptions, I found two female proselytes³ in the classical ones (114 in number), but not a single one on tombstones of later date.⁴ The colossal erudition of Wolfius ("Biblioth. Hebr.," II and IV) could only gather together forty-four names of proselytes during the Middle Ages, and with my utmost diligence I have only been able to add sixteen to these, five of whom died as martyrs for their new faith.⁵ As regards Moslem countries I cannot speak with such confidence. Moses de Coucy is said by Basnage to have rebuked the Jews of Spain for marrying Moorish women. But such intermarriage would only affect Sephardim, who form only 6 per cent. of the Jews of to-day, and would be for the most part with Semitic blood. The boasted tolerance of Islam⁶ only lasted down to 1040, and afterwards there was but little difference in the treatment Jews received under the Crescent and the Cross.

And even if history showed a greater infusion of Aryan blood than the above estimate would allow, the effect of this on Jewish characteristics would tend to be minimised by certain anthropological principles which have been completely overlooked by M. Renan and followers. I have already referred to the comparative infertility of mixed marriages (the Talmud

¹ Some of these were very distinguished, e.g. : Akiba, the Targumist Onkelos, R. Meir, Schemajah, and Abtalion; three others are mentioned by Derenbourg, p. 223 a. (Cf. Brüll, "Misnaelehrer von heidnischer Abkunft," in his "Jahrbuch," ii.)

² I owe this name to the erudition of my friend Mr. S. Schechter.

³ *Beruria*, re-named *Sara*, Orelli, No. 2522, and *Soteria*, who is termed *mater synagoga*, Id. No. 2523, both at Rome. A third given by Bernays, ii, 80, was not a full proselyte ("metuenti").

⁴ At Venice (Berliner), Toledo (Zunz), Paris (Longperier), Amsterdam (Castro), and other places given by Wolf, Zunz, and others.

⁵ Four at Wissemburg, 1264 (Neubauer, "Rev. Etudes Juives," No. 7), and one at Augsburg the same year (Zunz, "Literaturgeschichte," p. 350).

⁶ One of Maimonides' responses is to a proselyte from Islam (Frankel, "Entwurf," p. 30).

says they only produce girls, Nidda 13 *b*, Jebam. 62 *a*), and I would now point out its consequences. Taking the most extreme case imaginable, let us suppose that as many as one-tenth of all Jews and Jewesses married outside the pale. Estimating the pure Jewish population to increase uniformly half as much again each generation of thirty years, I suppose the mixed marriage to result in only one surviving child, so that the next generation only replaces its Jewish parents. Then gradually raising the fertility as the offspring marry with Jews, but never making it equal to pure Jewish marriages, I find that in six generations, or two hundred years, the original ten per cent. has sunk to little over two.

And even this small percentage would show but little traces of its alien origin, owing to another anthropological principle to which I now proceed to call attention, I believe for the first time. On examining some cases of mixed marriages, I was struck by the uniformity with which the children resembled the Jewish side, and I was led to make special inquiry into the matter, with the following results:—Of 84 such marriages examined by me, 9 were sterile; of 35 I could obtain no definite results; 22 showed Jewish prepotency; 13 Gentile, and 5 mixed. Now when it is remembered that if mixed marriages occurred in the Middle Ages the offspring must have married again within the Jewish pale, it is hardly likely that the Gentile blood would persist throughout the ages, even if it were prepotent, and if the above rather rough results have any validity the prepotency is rather on the Jewish side, and at any rate there seems very little tendency to real intermixture (only in five families out of forty-nine).¹ Another fact pointing in the same direction is the interesting point that in families into which there has been an infusion of Jewish blood this tends to appear in a marked and intensely Jewish cast of features and expression. I know of four instances of this myself, and Mr. Galton tells me that a couple occur in the family records he has been collecting. Now as reversion is mostly towards the side of greater prepotency, this curious fact confirms our conclusion as to the superior prepotency of Jewish blood.

(2) But it will be asked, and has been asked, "How will you account for the wide divergences from the Jewish type of skull, nose, eyes, hair, &c., which are shown in the statistics on these points given above, and must indeed be a matter of common observation?" M. Renan has decided this point literally

¹ The chance of a child resembling any ancestor might perhaps be roughly expressed by the reciprocal of its figure on Mr. Galton's system, "Record," p. 3; "Nature," Sept. 6th, 1883. Thus the chance of my resembling my maternal great-grandfather is $\frac{1}{14}$. Cf., too, Galton, "Her. Gen.," p. 327 *n*.

ex cathedra: seated in his chair at the Bibliothèque Nationale, he has observed the Jewish *savants* who have applied for his aid, and concluded that there are several types of Jews which are absolutely irreducible to one another ("Le Judaïsme," &c., p. 25). But the question of types is a question of averages, and you cannot so easily decide upon the non-existence of a type by pointing to a few divergences from it. An organism is not a manufactured article turned out by machinery, but may modify itself and be modified by the environment, introducing a principle of variability which causes the type to develop. An organic type therefore exists not where there is no variation, but where the variations follow the law of error, and where the modulus of variation is tolerably constant. This is in the main the case with most of the anthropological measurements I have laid before the meeting, and it follows that the variations, though they may be due to intermixture, may also be merely normal divergences from the standard.

It seems hardest to accept this result with regard to red hair, which we have seen to be exceptionally prevalent among Jews. Yet, as a matter of fact, red hair seems to be only a natural complement to black, so that for anthropological purposes we might even term red "light black." The colour of the hair is determined by the presence and amount of two pigments: when the darker is absent from any physiological cause red hair is the consequence, just as when both are absent albinism appears (Topinard, "Elements d'Anthropologie," 1885, p. 323). Now just as albinos occur among all races, including negroes, so does red hair. Eusebius declared that Adam was rufous, not only from the etymology of the name, but because red-haired men occurred among all the races of mankind (Topinard, *loc. cit.*). That "erythrism" among Jews is not due to intermixture, but probably to defective nutrition, is shown in the first place by its occurring among Jews of Africa and the East. It has been observed in Algiers, Tunis, Bosnia, Constantinople, Smyrna, Syria, Persia, and Bokhara.¹ Secondly, from my analysis of Dr. Beddoe's results, it will be observed that red hair occurs among Sephardim to a greater extent than among Ashkenazim, and it has never been contended that the Sephardim have mixed much with any race markedly rufous.² And, thirdly, when it does occur among Ashkenazim of North Europe, it is found more among Jews than in

¹ Dr. Beddoe has paid particular attention to this point; see his paper previously cited, pp. 12-19 of the reprint and table at end. Andree, "Zur Volks.," p. 35, repeats most of this but is mistaken in saying that rufous Jews have been observed at Cochín. I have seen somewhere that the red-haired Jews of Palestine claim to be Benjamites.

² A certain amount of erythrism was, however, introduced into Spain by the Goths (*cf.* Beddoe, *loc. cit.*, p. 24).

the indigenous population, whereas if it were due to intermixture we should expect to find the amount of erythrism among Jews intermediate between that of the natives among whom they dwell and the supposed original black hair of the Semites. Indeed, but for the abundant presence of red hair among Scotchmen it might be more open to explain the origin of red hair among Europeans as due to an infusion of Jewish blood than to account for it among Jews by assuming intermixture with Aryans.

The argument from red hair being thus dismissed with costs, the existence of blue eyes among Jews in relatively large proportions need not be regarded as overwhelming proof of intermixture. As is well known, all eyes are blue at birth, *i.e.*, we see through to the back of the baby's iris, and if no pigment cells are deposited in the iris the eyes remain blue to the end of life (Topinard, *loc. cit.*). Thus blue eyes, as well as red hair, are a kind of minor albinism, and may result from defective nutrition or other physiological causes like red hair. That this is probably the real cause of its occurrence among Jews is confirmed by the fact that we find blue eyes among Asiatic as well as European Jews (*cf.* Beddoe, *loc. cit.*).

It may be convenient that I should here add what little evidence I have been able to collect as to the appearance of Jews in the past. It is a question whether Esau (Edom) was regarded as having red hair (Gen. xxv, 25), because that colour was frequent among the Idumæans. Dr. Beddoe suggests that red hair among Jews may have been due to intermixture with Idumæans after they became proselytes; but the existence of red hair among them, their proselytism,¹ and their intermarrying with Jews are all more or less conjectural. In the regulations about leprosy (Lev. xiii) it seems to be implied that the hair was black, or at any rate dark. The Shunamite says, "I am black [swarthy]. . . . for the sun has browned me" (Cant. i, 5), but on the other hand speaks of the "raven locks" of her beloved (*ibid.*, v, 11). If we could trust to the etymologies of proper names the five persons bearing the names Harim and Harumaph in the Bible had flat noses. The first definite information I can find is contained in a saying of a Mishnic Rabbi, R. Ishmael (about 120 A.D.), who says (Neg. ii, 1), "The sons of Israel are like boxwood, neither black nor white, but between the two," *i.e.*, of olive complexion. Both Mishna and Gemara seem to use "black" (*shachar*, *vide* Buxtorf, *sub voce*, col. 2372) as synonymous both with "hair" and with "youth."² The

¹ Derenbourg ("Essai," p. 227) says that the proselytism of the Idumæans was more political than religious.

² It is to be remarked, however, that the chief passage (Pirke Aboth iii, 12) on which this identification is based is not of certain interpretation. See Taylor, p. 63, Geiger ("Nachg. Schr.," iv, p. 338), and Strack *in locum*.

Targum or Chaldaic paraphrase on 1 Sam. xvi, 12, makes David "red-haired" instead of "ruddy," and the mistranslation has passed into Luther's version. This shows at least that the Jews of the time when the Targum was written (about 600 A.D.) were not averse to regarding the typical Jewish king as rufous. The light hair given to the Christ in early Art,¹ the traditional red hair attributed to Judas Iscariot, as well as the golden locks of Mary Magdalene, require further investigation. Later on I find Jehuda Halevi (c. 1140 A.D.) speaking of the golden hair of his beloved,² a Spanish Jew, Roven Salomo, 1349 A.D., with light brown hair,³ and Rembrandt's Rabbi in the National Gallery has a red beard. All these indications serve to show that red hair at least is no late importation into Jewish anthropology.⁴ Evidence about blue eyes is more difficult to obtain, as it is still a doubtful point among scholars whether either Bible or Talmud has any word to express blue.

Altogether, then, the two chief arguments hitherto urged to prove intermixture—which may be roughly summarised as proselytism and red hair—cannot be said to be decisive, while there are other more positive arguments tending to show the comparative purity of the Jewish race, and to these I now turn.

I. The first and perhaps chief of these is the existence of a class of Jews who are not permitted by Jewish law to marry even full proselytes. These are the priests, or *Cohanim*, the Beni Aaron or sons of Aaron. We have already seen that at the time of the Maccabees, Jews were addressed in the Psalms under three appellatives—Israelites, Aaronites, and Proselytes. The sons of Aaron could only intermarry with the daughters of Aaron or of Israel. The discussion about the comparative purity of Babylon and the surrounding districts which gave rise to the saying, "Babylon is sound, Mesene dead, Media ill, and Elam on its last legs" (Kidd. 71 a), was probably concerned with the purity of Cohanite marriages, for which any perceptible amount of "paste" or intermixture was considered as objectionable.⁵ The

¹ See "Dict. Christ. Antiq.," art. "Christ, Early Representations of," and authorities there quoted.

² Geiger, "Divan," p. 123. The poet uses, I regret to observe, the same words as are used in the Bible to represent the discoloration of the hair on the leprous spot (Lev. xiii, 30).

³ Figured in "Rev. d. Et. Juives," No. 12.

⁴ It is worth while remarking that the Cozars, according to Ibn Foslān, had black hair (cf. Lagneau, "Denombrement," p. 49, note).

⁵ Upon the difficult question of *Issah*, or "paste," there are two papers in Graetz, "Monatsft.," one by Graetz himself, "Illegitime Mischehen in Judāa," 1879, pp. 481-508, and one by F. Rosenthal, "Ueber Issah," 1881, pp. 38-48, 713-723, 207-217. Cf. too, Graetz "Das Königreich Mesene," pp. 31-33. I fancy that the custom of consanguineous marriages may be connected with the desire to preserve purity of descent; cf. R. Meir's recommendation (Kidd. 71 a, "Monats," 1879, p. 507), and Tobit, who marries of his own kindred (i, 9).

saying and similar ones cannot be pressed to prove any wide admixture, and only serve to show how carefully the purity of Cohanite marriages was preserved, and the notice taken of any deviations from endogamy. It will be of interest to ascertain the number of these Cohanim who are themselves pure, and must have set an example of exclusiveness to their fellow-Jews. In the return under Nehemiah, the four families of priests numbered 4,289, out of 49,942 (Neh. vii, 39-42, 66, 67). In two lists of martyrs killed at Nurnberg in the years 1298 and 1349, the Cohanim number 91 out of 1,300, almost exactly the same proportion as in Ezra's time, though one may expect to find the Cohanim more ready to suffer martyrdom than other Jews.¹ In Jewish ritual it is customary that the first "called up" to the reading of the Law should be a Cohen, and there are only five on ordinary days and eight on Sabbaths and festivals,² thus indicating that a large supply of Cohanim was regarded as usual. Among the two hundred inscriptions of the Venice "House of Life" or burial ground collected by Dr. Berliner ("Heb. Grab-schriften," 1881), there are thirteen Cohens (6.5 per cent.), though here again it is probable that a greater proportion of these would be honoured with tombstones. The descendants of such Cohanim live and flourish at the present day, but it is impossible to determine their number, as their civil surname may not be Cohen. Thus Dr. N. M. Adler, the present Chief Rabbi of England, is a Cohen, though it is not necessary for a Jew to be a Cohen in order to be a minister. In lists of 4,720 English Jews I found the Cohens to form 3 per cent., while in a Continental list of 4,600 they were but 2.3 (my "Studies," p. 4). The latter is probably somewhat misleading,³ as in a list of 335 Jewish celebrities in all European lands, culled from dictionaries of contemporary biography, the Cohens number eleven, or very nearly 4 per cent., while I know of at least five of the remainder who might call themselves Cohen. Altogether I am inclined to think that there are about 5 per cent. of Cohanim among Jews, and these cannot have had any direct mixture with the outer world.⁴

But though they may never marry a proselyte, they may

¹ I calculate these from the lists given by Dr. Neubauer, "Memorbuch de Mayence," *Revue*, No. 7, p. 10; and the Rev. W. Lowe, "Memorbuch of Nurnberg," 1880.

² This and the priestly benediction are the only two functions now performed by Cohanim; it would be interesting to learn the origin of the position of the fingers in the latter function, which are spread so as to leave a gap between the first and the last two.

³ Lippe's "Bibliog. Lexicon" contains a large proportion of names of ministers, and small congregations object to a Cohen as a minister, as he must not approach a dead body (Lev. xxi, 1).

⁴ There are said to be less Cohanim among Sephardim.

marry the daughters of proselytes, and thus introduce alien blood. R. Jose was for allowing them even to marry proselytes, while R. Jehuda declared against their marriage with any child of a proselyte: the law, however, went with the opinion of R. Eleasar ben Jacob in the early part of the second century, who permitted marriage between a priest and a woman one of whose parents had been a proselyte (Mishna, Kidd. iv, 7). Owing to this decision, later authorities doubted whether there were any true Cohanim, *e.g.*, Isaac ben Shesheth, of the thirteenth century, while R. Samuel b. Modena, of the sixteenth, even allowed a Cohen to transgress the Law on this ground (Löw, "Lebensalter," p. 114, and notes p. 391). There is also an amusing tradition told in the Talmud, aspersing the purity of Cohanite descent. It is said of Pashur ben Immer (in whom two of the four Cohanite branches appear to be conjoined), that he had four hundred female slaves, and that if you find an impudent Cohen nowadays, he is certainly descended from Pashur ben Immer (Kidd. 70, *b.*)¹ I may add that even at the present day Cohens have the reputation of being hotter-tempered than other Jews. All these indications may modify any claim for absolute purity among Cohanim; and the fact that they do not differ perceptibly from other Jews may serve as an argument either for the general purity of the race, or, on the other hand, for the mixed origin of the Cohens, which would be very difficult to prove to any large extent.

II. Another point on which I would lay stress, if the suggestion I make is borne out by facts, is with regard to the comparatively small variation of type among *Jewesses* as compared with Jews. I seem to observe that Jewesses have more uniformly what we term the Jewish face than Jews have. It is a universal law of animal life that, owing to sexual selection and other causes, the males of a species vary considerably more than the females. And, conversely, where we find the females varying less than the males we may conjecture that we have a case of true species. Even more in Jewesses than in Jews, we can see that cast of face in which the racial so dominates the individual that whereas of other countenances we say, "That is a kind, a sad, a cruel, or a tender face," of this our first thought is, "That is a Jewish face." That the difference should be almost innately perceived by Jews who have for nearly two thousand years associated all that is kindly with this type would be natural. But the difference is almost as readily discerned by Gentiles, and even the negroes of Surinam, when they see a European and a Jew approach, do not say, "Here are two whites," but "Here is a white and a Jew" (Duttenhofer ap. Andree, "Volks.," p. 38).

¹ I owe this reference to the kindness of my friend Mr. Schechter.

I lay stress upon this point of expression because it is after all the chief external trait that can be fixed upon as typically Jewish. We have the evidence of the monuments for its persistence through the ages, and the scientific evidence of its typical character in the "composites" produced by Mr. Galton's process, and given with this paper. Mr. Galton agrees with me that he has been more successful in producing definite types with Jewish boys than with any other of his subjects (*cf.* the plate prefixed to his "Inquiries into Human Faculty"). It must be allowed, however, that there is great force in the argument which would attribute the Jewish expression to the influence of isolation, so that we might define it as *Semitic features with ghetto expression*. But against this reasoning may be urged the early appearance of the Jewish type in the Assyrian monuments, and further, the fact of its appearing among the results of mixed marriages, where it must be racial. I have already pointed out what I consider to be the part of the Jewish expression due to isolation—the intensity of the gaze shown so well in the adult "composite" D, a fitting expression of a severe struggle for existence.

The earlier period at which "the custom of woman" (Gen. xxxi, 35) appears among Jewesses (*supra*, p. 39, note) is another trait which, if substantiated by wider induction, must be regarded as distinctly racial. If Darwin's explanation of its origin ("Descent," 1st edit., I, p. 212) be correct, it must have preserved its periodicity for an incalculable time, and it may be surmised that any other temporal relation, such as the age of its appearance, would be equally persistent. If it appears among Jewesses of St. Petersburg at the same early age as among Southern Asiatics, the Eastern origin of the former may be considered as well established.¹ But I fear that I am here falling into the same error that has misled so many inquirers into Jewish biostatistics: I may be trusting to statistics derived from a few hundred subjects to decide on a question affecting several millions. I will therefore content myself with pointing out the importance of the subject and the need of further investigations.²

III. And, finally, in dealing with the question of the racial purity of Jews, as in the main we must deal with it, historically,

¹ On the other hand, the Talmud fixes the age of puberty for girls at the beginning of the thirteenth year, *i.e.*, when twelve years old (Nidda 46 a; Löw, "Lebensalter," p. 142); this seems earlier than at present.

² There is probably something distinctive about the gait of Jewish women. Here in England, at any rate, most Jewesses can be distinguished at once by their swaying walk, due to their walking from the hip, not from the knee. I am uncertain whether this distinction is merely a Continental habit imported into England, or whether it can be traced back to the times of Isaiah (iii, 16).

one has to take into account the fact that it takes two to make a mixed marriage, and that up to the present century there has been a repulsion, not perhaps wholly on one side, between Jews and Gentiles, which would scarcely allow of any wide communion such as would be implied in extensive intermarriage.¹ The ancient and mediæval States were Churches as well as States, and could not allow those to be citizens who could not be of the State religion. The isolation into which Jews were thus cast led, in the course of time, to a feeling of combined contempt and terror about them among the populace. The folklore of Europe regarded the Jews as something infra-human, and it would require an almost impossible amount of large toleration for a Christian maiden of the Middle Ages to regard union with a Jew as anything other than unnatural. The ancients had something of this feeling, and it was trebly intensified when the Church rose into power, regarding the Jews as the arch-heretics, the Deicides, the incarnate anti-Christ. Even at the present day, with all its toleration or indifference, much of this feeling remains, as sad experience has shown in Germany, Austria, Russia, and Roumania, and while it lasts no commingling of the opposing parties can take place on a large scale. At the present day the only country where mixed marriages occur in appreciable numbers is Prussia, where the majority of the offspring are brought up as Christians ("Studies in Jewish Statistics," p. 54). Taking all the Jews of the world it may be doubted if one mixed marriage occurs to five hundred pure Jewish marriages. And if this is so under the most fortunate circumstances Jews have ever known, intermarriage is not likely to have been more frequent in times of greater mutual repulsion. We might take the condition of affairs in Algeria as answering to the most favourable relations of Jews and Christians in the Middle Ages. Yet what do we find there? During nearly half a century (1830-77) in an average population of 25,000 Jews there have only been thirty mixed marriages altogether—not one a year (Ricoux, "*La Demographie de l'Algerie*," 1880, p. 71).

For these reasons I am inclined to support the long-standing belief in the substantial purity of the Jewish race, and to hold that the vast majority of contemporary Jews are the lineal descendants of the Diaspora of the Roman Empire. The question is one the main interest of which is anthropological, and its

¹ Even in the most isolated "colonies" of Jews, strenuous efforts seem to have been made to prevent fusion with the surrounding races. The white Jews of Cochin still preserve their identity from the black Jews. The Jews of China, the most isolated of all, seemed to have stood out for a long period. Even in 1851, two *Tsungs* (or 100 families) of the eight of which they were composed did not marry the daughters of the "heathen Chinese" (Finn, "*Orphan Colony*," p. 23).

complex difficulties can only hope for an ultimate solution from the progress of the Science of Man. I have therefore been glad of an opportunity of bringing it before the Anthropological Institute.

Explanation of Plates I and II.¹

The plates I and II accompanying this paper (first given in the *Photographic News* of April 17th and 24th, 1885, with articles by Mr. Galton and myself, the former explaining the process fully) give eight composites of Jewish lads on the left hand sides and opposite to the top and the bottom composite, the five components of which in each case they are composed. The middle composite on the right hand side is a co-composite of the other two, and thus practically contains the whole of the ten components. The composite on the extreme left is in each case that of five older lads who are not shown. The composites have capital letters attached to them, the components smaller letters corresponding to the former. Thus A is the composite produced by taking the photographs $a_1, a_2, a_3, a_4,$ and a_5 accurately one on top of the other on the same sensitized plate. The discrepant features blur out while the common characteristics intensify one another and produce a *type* of all the components. B represents in the same way b_1 to b_5 , and C is then formed by superimposing A on B on the same negative.² D is a composite produced like A from five photographs of older youths which could not be given for want of space. Similar explanations apply to the composite E to H.

Of the fidelity with which they pourtray the Jewish expression there can be no doubt. Each of the eight composites shown might be taken as the portrait of a Jewish lad quite as readily as any of the components. In some cases, indeed, *e.g.*, f_3 , the portraits are less Jewish than the composites. The individuality and, I may perhaps even add, the beauty of these composites are very striking. It is difficult, even for those who know the process, to grasp the fact that the composite E is anything but the portrait of an individual; and the same may be said of D, the composite of five older lads, whose portraits are not shown. A, again, the composite of the five a 's, reminds me of several Jewish youngsters of my acquaintance, and might be taken for a slightly blurred photograph of any of them. This is the more curious since A does not resemble very closely any one of its components. These facts are something more than curious; they carry with them conclusions of scientific importance. If these Jewish lads, selected almost at random, and with parents

¹ The Council is indebted for these plates to the kindness of Mr. Thomas Bolas, of the *Photographic News*.

² C was afterwards "stiffened" by the addition of three other photographs.

from opposite parts of Europe, yield so markedly individual a type, it can only be because there actually exists a definite and well-defined organic type of modern Jews. Photographic science thus seems to confirm the conclusion I have drawn from history, that there has been scarcely any admixture of alien blood amongst the Jews since their dispersion.

These composites, there can be no doubt, give the Jewish expression. What do they teach us as to the elements which go to form it? The popular idea of a Jewish face is, that it has a long nose. But the full-face composites A to D have decidedly the Jewish expression, though the shape of the nose does not appear; and further, in composite H, as well as in co-composite G, which represents ten Jewish boys "rolled into one," the shape of the nose is markedly blurred, showing that there is no uniformity in this respect. The popular impression seems, then, to be disproved by these composites. Yet it contains a part of the truth, as do most of those rough averages which we term impressions. The nose does contribute much towards producing the Jewish expression, but it is not so much the shape of its profile as the accentuation and flexibility of the *nostrils*. This is specially marked in the composite D. Take a narrow strip of paper and place it over the nose in this composite, and much, though not all, of the Jewish expression disappears. And in the profile *components* it will be observed that every face has the curve of the nostril more distinctly marked than would be the case in the ordinary Teutonic face, for example.

A curious experiment illustrates this importance of the nostril towards making the Jewish expression. Artists tell us that the best way to make a caricature of the Jewish nose is to write a figure 6 with a long tail (fig. 1); now remove the turn of the

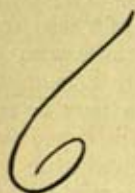


Fig. 1.



Fig. 2.



Fig. 3.

twist as in fig. 2, and much of the Jewishness disappears; and it vanishes entirely when we draw the continuation horizontally as in fig. 3. We may conclude, then, as regards the Jewish nose, that it is more the nostril than the nose itself which goes to form the characteristic Jewish expression.

But it is not alone this "nostrility" which makes a Jewish

face so easily recognizable. Cover up every part of composite A but the eyes, and yet I fancy any one familiar with Jews would say, "Those are Jewish eyes." I am less able to analyse this effect than in the case of the nose. The fulness of the upper lid, and the protuberance of the lower, may be remarked, as well as the scantiness of the eyebrows towards the outer edges. The size, brilliance, and darkness of the iris are also well marked. Many persons have remarked to me that Jewish eyes seem set closer together, and this property is seen in composites A and D giving much of its expression to the latter. I fail to see any of the cold calculation which Mr. Galton noticed in the boys at the school, at any rate in the composites A, B, and C. There is something more like the dreamer and thinker than the merchant in A. In fact, on my showing this to an eminent painter of my acquaintance, he exclaimed, "I imagine that is how Spinoza looked when a lad," a piece of artistic insight which is remarkably confirmed by the portraits of the philosopher, though the artist had never seen one. The cold and somewhat hard look in composite D, however, is more confirmatory of Mr. Galton's impression. It is noteworthy that this is seen in a composite of young fellows between seventeen and twenty, who have had to fight a hard battle of life even by that early age.

There remains the forehead, mouth, and chin to add their quota to the Jewish expression. The predominating characteristic of the forehead is breadth, and perhaps the thick and dark hair encircling it has something to contribute to the Jewishness of the face. The thickness of the lips, and especially a characteristic pout of the lower one, come out markedly in components and composites, both full face and profile. One may observe, too, the dimples (if one may use the term) which mark the termination of the mouth, and are seen in an exaggerated form in α_1 . Finally, the heavy chin, especially marked in the profile composites, confirms the popular association of this feature with the quality of perseverance, so ingrained in the Jewish nature.

We learn, then, from these composites that the Jewish expression is considerably more complicated than is ordinarily thought. Judged by these composites the Jewish face has accentuated flexible nostrils, largish mouth, with ends well marked, and pouting under-lip, heavy chin, broad forehead, with prominent superciliary ridges scantily covered with hair towards the outer extremities, and large brilliant dark eyes, set closely together, with heavy upper and protuberant lower lid, having a thoughtful expression in youth, transformed into a keen and penetrating gaze by manhood.

But words fail one most grievously in trying to split up into its elements that most living of all things, human expression;

and Mr Galton's composites say in a glance more than the most skilful physiognomist could express in many pages. "The best definition," said the old logicians, "is pointing with the finger" (*demonstratio optima definitio*); and the composites here given will doubtless form for a long time to come the best available definition of the Jewish expression and the Jewish type.

DISCUSSION.

The Rev. Dr. HERMANN ADLER (Delegate Chief Rabbi) congratulated the President on having chosen a subject of such profound interest to the student of anthropology. He agreed with the view propounded by Mr. Jacobs in his exhaustive paper, that on the whole there had not been any large foreign admixture with the Jewish race. As a theme for further inquiry, he drew attention to the copies in Dr. Wright's "Empire of the Hittites" of the representations discovered near Carchemish of the ancient inhabitants of that country. Their features bore an extraordinary resemblance to the inferior Hebraic type, with low forehead, hooked nose, and thick lips. If the hypothesis of Professor Sayce and Dr. Wright were accepted as correct, might the existence of this type, which argued kinship with the Mongolian race, and which differed so materially from the characteristic features of the Semitic race—the expanded forehead and symmetrical lineaments—be traced to intermarriage with the Hittites who are represented in the Bible as descended from Ham? The dark and the blonde type, the speaker believed, should be regarded as original, dating from Bible times and described respectively in Canticles v, 11, and 2 Samuel xvi, 12. That the existence of the blonde type was not due to intermarriage might be proved by the fact that it was to be found among the Jews of North Africa, Syria, Arabia, and Persia, where, owing to the prevalence of fanaticism, mixed marriages had rarely, if ever, taken place. Goethe, a man of science as well as a poet, had pithily summed up the main anthropological characteristic of the Hebrew race in the words: "Es ist das beharrlichste Volk der Erde. Es ist, es war, es wird sein."

Dr. BEHREND observed that M. Littré had well said that all springs of human conduct arose from two instincts, that of self-preservation, and the reproductive instinct for the preservation of the race. The rightful cultivation of these two instincts led to the primary desire of all humanity—happiness, and the chief element in human happiness was health. Health, both of body and

¹ Note by Mr. Jacobs.—These Jewish-looking "Hittites" were probably the Semitic vassals of the genuine Hittites. Mr. T. Tyler has pointed out to me at the British Museum two types on the monuments, one of Mongolian features and a kind of Chinese tail, the other of the ordinary Semitic type. The latter he conjectures to be the vassals of the former, and thus their Jewish appearance is simply another example of the identity of the Jewish and the Semitic type.

THE JEWISH TYPE.

Full Face.



THE PHOTO. STANBUSH & CO. LONDON

COMPOSITES.

FRANCIS GALTON, FRS. PHOTO.

Components.

ILLUSTRATIONS OF COMPOSITE PORTRAITURE.

mind, depended mainly upon conduct, not only of the individual, but also from heredity. Therefore we should expect that as conduct (and through conduct, health; and through health, happiness) was the object of religion, a code of religion should lay down laws, which would be a guide of conduct, and thereby conduce to health and happiness. These primary instincts, that of self-preservation and the reproductive instinct, were mainly regulated in the Jewish code by laws concerning diet, circumcision, and the sexual relations. The speaker had shown elsewhere at length (in a series of papers "On the Communicability to Man of the Diseases from Animals used as Food") that the Hebraic dietary laws preserved from the transmission of such diseases, and especially from the ravages of tuberculosis, which in its various forms was accountable for at least one-fifth of the entire mortality in this country. The sexual relations were regulated in the Hebrew code by laws which aimed at conserving the highest attainable degree of virility, by restraining undue indulgence, and ensuring procreation only at a specially healthy period. We need hardly pause to dwell on the enormous advantages such a start in the battle of life must give towards the "survival of the fittest."

The special biostatic privileges of Jews might be summed up in the proved facts that they married less, had fewer births, died less (that is, lived longer), increased at a greater rate, and had fewer stillborn and illegitimate children than any other race. It was quite unnecessary to repeat the statistics upon these points: they had been given over and over again, as by Hoffmann, Kolb, Bergmann, Legoyt, Bernouilli, Lagneau, Loeb, and many others; but it was interesting, and to the Jews vitally instructive, to note that in proportion as they mixed with other races—either of their own accord or by the spread of social tolerance—they lost these biostatic privileges, and the differences became effaced. Thus M. de Bergmann ("Beiträge zur Geschichte der Bevölkerung in Deutschland") showed that the relation of the sexes among the Jews in Posen had of late become much modified: that while from 1819 to 1864 it was as 111.94 boys to 100 girls, it fell to 106.39 to 100 from 1864 to 1873; similarly, the proportion of illegitimate births among them had increased, showing a relaxation in their adherence to the Mosaic code. In every one of the biostatic privileges they enjoyed, the penalty had to be paid for laxity of observances, and either in their own persons or in their descendants those who transgressed had to submit to the inexorable law of "being cut off from their own people," as far as was concerned in their share of the physical advantages of their race.

Mr. F. D. MOCATTA remarked that in addition to the two greater divisions of the Jewish race, Sephardim (Spanish) and Ashkenazim (German), not to mention the Italian Jews, there were various other families of Jews, such as those of the interior of Morocco, speaking Arabic, and not Spanish, those of Persia and of Yemen, and others. Besides these were large numbers of Jews in various countries, who might be considered not to be of the seed of

Abraham, or only to be to a greater or lesser degree crossed with it. Such were the Beni-Israel of Bombay, those of Foo-Choo-Foo (now nearly obliterated), the Riff Jews of the north of Morocco (an armed warlike set, loosely adhering to Judaism, but differing in physique and habit from other Jews), the nearly black and crispy Malabar Jews, &c. Also the Jews of South-East Russia in Europe who speak Russian, and are a well-developed, hardy, and generally ruddy race, are probably a different family from those of Poland and Central Russia, who still speak a dialect of German, their ancestors having been driven out of Germany at the period of the Crusades. This family might possibly represent, as the Karaites of the Crimea were often supposed to do, the descendants of the Khazars, a tribe on the Caspian, who about the seventh century founded a state and maintained it for the best part of two centuries, adopting the Jewish religion. All these, so to speak, outlying families of Jews might be regarded as descendants of proselytes, but as they had blended but very little with the general mass of the Jews, they did not much affect the subject then under consideration. In Biblical times the Jews frequently made matrimonial alliance with the surrounding populations, and it was a constant theme of the reproach of prophets and reformers, notably of Ezra and Nehemiah. Later on, at the time of the conquest of Titus, and when Christianity was only dawning on the Latin world, many Jews were carried to Rome, the bulk being the common people, who were put to labour on public works, and often devoured at gladiatorial shows; but some of whom being scholars and persons of refinement were admitted into Roman society, and by the purity of their doctrine won over to their philosophy and religion many of the higher classes, notably women, who were becoming tired of the superstitions and worldliness into which the pagan religions had degenerated. This probably led to alliances, and such is M. Renan's opinion. The Jews also, ever prone to adopt the habits and manners of surrounding nations, became lax, Romanised and Hellenised their names, as was evidenced in the Jewish catacombs at Rome, and probably contracted marriages with the people around them. All these sources might have led to an admixture of non-Jewish blood, the extent of such admixture (the alliances being at all times exceptional rather than general, and having become rarer with the persecutions which set in in the earlier ages of the Christian Church) was not likely to have essentially modified either the type or the physical or moral characteristics of the Jewish race, which might therefore be regarded for all practical purposes as pure. This was all the more probable since a large number of the issues of such mixed alliances naturally fell back to the dominant religions of the various times and countries, and ceased to have anything to do with Judaism. The speaker said he had not alluded to alliances made between Jews and Oriental peoples, Mohammedans, &c., in earlier times, firstly because it would be difficult to prove their frequency or the contrary, and secondly, because these peoples, being for the most part Semitic themselves, the changes thus induced would have been far less accentuated.

Sir JOSEPH FAYREER had no criticisms to make on the erudite papers which had been read that evening, but would ask one or two questions, first remarking that he had known Jews in Calcutta where one member of the family had light hair and grey eyes, another dark hair and complexion. It struck him that the Armenians presented those peculiar characteristics of physiognomy which were usually attributed to the Jew. Was this not simply a question of race, both being Semitic, and should not the so-called Jewish physiognomy rather be called Semitic than be regarded as the special attribute of the Hebrew as distinct from other Semitic races such as the Armenian? The speaker would ask the learned author of the second paper (Mr. Jacobs) if he could give any information as to the relation of the Afghans to the Jews? They undoubtedly had the physiognomy strongly marked,—it was often said they were descendants of the lost tribes, and there was a tribe among them calling themselves Beni-Israel. What was known and accepted among erudite Jews as to the origin of the Afghans? Again, what was the origin of the race of Black Jews on the Malabar coast? Were these not a mixed race, and were they not the result of admixture with the Teluigan races of Southern India? Pure as the Jewish race is, it would seem that it must be recognised that evidences of such admixture with other races did exist, and it would also seem that they had taken more or less an impression from their surroundings and from the character of the races among which they had settled.

Mr. LUCIEN WOLF did not agree with Mr. Jacobs' view of the physiological characteristics of Jews. Mr. Jacobs practically denied the existence of these characteristics, whereas the speaker felt inclined not only to assert their existence, but to assert that they were as well defined as to form real race distinctions. This view could be proved by statistics, and figures could also be given to prove the immunity of Jews from phthisis, which Mr. Jacobs contested. The purity of the race could not be demonstrated by anthropological measurements, for, physically, Jews varied enormously. It was different with their vital characteristics, and while we found that these were maintained at a high average we might rest assured that the race was being conserved. The evidence brought forward by Dr. Neubauer in favour of his view that the Jewish race had not kept itself pure told against the proposition it was intended to support when it was tested by other evidence. Thus it might be asked how was it that, notwithstanding these large accessions to Judaism, the race had not increased, and that in spite of these large infusions of alien blood, so important a vital characteristic as its high reproductive power has not become modified. It must be obvious that had the remarkable multiplying power of the Jews been left unchecked they must have increased far beyond their present numbers, and if they could receive accessions from other races without diminishing this power, then by this time they ought to have peopled the world. The conclusion must be then that the mixed marriages referred to had

not affected the purity of the race. By their tendency to sterility they have periodically carried off the perpetually growing fringe of Judaism, leaving always a pure nucleus to repropagate itself. Thus by bringing to light the fact that mixed marriages were generally sterile, the evidence cited by Dr. Neubauer, instead of telling against the purity of the Jewish race, revealed the most powerful argument in its favour. Nor was this theory of sterility a theory only. The speaker had investigated a large number of cases of mixed marriages—not quite so many as Mr. Jacobs—and in every single case he had found, if not absolute sterility, at least a falling off in the vital power of the offspring, placing them far below the average obtaining in the Jewish community. This falling off was only postponed sterility, as he had had occasion to prove himself by investigating the history through several generations of a few mixed marriages.

Mr. MARCUS N. ADLER said that in his capacity as Actuary he had had opportunities of examining various statistics bearing on the subject under discussion. He agreed with Mr. Jacobs' remark that in the case of Jews mixed marriages were not so productive as ordinary marriages. On this point Herr von Fircks had published some interesting statistics in the official Journal of the Statistical Bureau of Prussia, and a good deal of weight must be attached to these figures, inasmuch as the entire population of Prussia is compared with the Jewish population, which exceeds 300,000. It would appear, dealing with the averages from the year 1875 to the year 1881, that out of 100 marriages—

Where both parents were Protestants	there were 430 children.
“ “ “ “ Roman Catholics	“ “ 520 “
“ “ “ “ Jews	“ “ 441 “
“ one of the parents was a Protestant and the other Roman Catholic	“ “ 325 “
“ one of the parents was Christian and the other Jewish	“ “ 165 “
“ the father was a Jew and the mother a Protestant	“ “ 131 “

If we bore in mind that out of the number born not one-half attained marriageable age, and a still less number actually married, it followed that the descendants of mixed marriages were comparatively few, and this consideration became an important element in the argument as to the comparative purity of the Jewish race at the present day. With regard to insanity, there was little doubt but that it was more prevalent amongst Jews than among the Christian population. M. Legoyt published some statistics which would show that while one person was insane out of every 1,200 Protestants, and one person insane out of every 1,000 Roman Catholics, amongst the Jews one person was insane out of every 760. It would not do to ascribe this to marriages amongst near relations being rather frequent amongst Jews, for if so, why should there be a larger number of insane amongst Roman Catholics than amongst Protestants, seeing

that amongst the Roman Catholics marriages between cousins are prohibited? Moreover, Mr. George Darwin, in an interesting article which appeared in the *Fortnightly Review* in 1875, showed that insanity is not more prevalent in the offspring of marriages of cousins than in the offspring of other marriages. It was, however, found that persons living in towns were more subject to insanity than those living in the open country, and since the Jews mostly inhabit towns, the speaker was disposed to ascribe the more numerous cases of insanity among the Jews to the fact of their living among densely populated districts, also to their being more addicted to head work than to manual labour, and to many of them being of rather a nervous temperament.

Dr. ASHER believed that the figures supplied by Mr. Joseph Jacobs as to the prevalence of phthisis among Jews were entirely fallacious. Jews had an extraordinary power of resistance to phthisis, but when exposed for sufficient time to all those surroundings which lower vitality beyond the limits which their constitutions could bear, they necessarily succumb, but they endured and resisted far far beyond what would kill those not of their race. From an experience of several years as surgeon to the Jewish Board of Guardians, the speaker was enabled to say that phthisis among English Jews was almost unknown: the vast majority of those who died from tuberculosis were Russians or Poles, who in their own countries had been herded together under the most insanitary conditions. It was no more fair to accuse Jews of special liability to tuberculosis on account of those deaths than it would be to say that Brompton is a district specially liable to that disease because there were so many deaths therefrom in the hospitals with which the district abounded. Figures and facts substantiating the above would be found in the report for 1859 of Dr. Septimus Gibbon, Medical Officer of Health.

Mr. JOSEPH JACOBS, in reply, expressed his regret at the absence of Dr. Neubauer, which had deprived the meeting of his valuable criticism, though it had doubtless freed himself from a formidable opponent. He was under the impression that the translation "red-haired" in 1 Sam. xvi, 12, was mistaken, and that the word *edmoni* simply implied "ruddy," which might apply to a dark as to a fair complexion. He had only referred to the mistranslation of the Targum as showing that Jews of the sixth century A.D. saw no objection to a Jewish king being red-haired. There was no special Jewish theory of the origin of the Afghans. They shared with many other races of uncertain origin the doubtful honour of being connected with the Ten Tribes about whom so many wild theories had been broached. This was possible; or their Semitic appearance might be due to descent from the tribes of North Arabia or Mesopotamia. The Black Jews of Malabar were known to be proselytes of the White Jews who had arrived there. Mr. Wolf's remarks seemed to him to overlook the great complexity of the problems dealing with the origin of the biostatic and physical characteristics of the Jews. These might be due either to common

race or to common customs, and he was inclined to attribute them mainly to the latter. He had not denied their existence, indeed he hoped he had exhibited them with a larger body of evidence than had hitherto been collected. But he doubted whether they could be adduced to prove the purity of the Jewish race, which was the immediate question before them. There was no evidence to prove that the Jews in mediæval times had increased with the rapidity they are doing at present, and in any case their increase would be much checked by their persecutions which had carried off, he had calculated, over 382,000 victims. As regards phthisis, notwithstanding the remarks that had fallen from the medical gentlemen present, he could not ascertain any definite facts proving that Jews possess any racial immunity from the disease, though he had not "accused" them of any special liability to it. As Dr. Asher had owned, Jews were sometimes more and sometimes less afflicted by tubercle than their neighbours, showing that environment had most to do with their liability to consumption. In conclusion, he expressed a desire to hear the opinion of trained anthropologists on the main question. If light hair and eyes amidst a race generally dark necessarily proved intermixture, then one-fifth of contemporary Jews afforded that proof, though he had shown that these existed at a very early date. But if not, he saw no reason from history for denying that the Jews of the present day were the direct descendants of the Jews of the Bible.

Note by Mr. F. Galton.

The individual photographs were taken with hardly any selection from among the boys in the Jews' Free School, Bell Lane. They were the children of poor parents. As I drove to the school through the adjacent Jewish quarter, the expression of the people that most struck me was their cold, scanning gaze, and this was equally characteristic of the schoolboys.

The composites were made with a camera that had numerous adjustments for varying the position and scale of the individual portraits with reference to fixed fiducial lines; but, beautiful as those adjustments are, if I were to begin entirely afresh, I should discard them, and should proceed in quite a different way. This cannot be described intelligibly and at the same time briefly, but it is explained with sufficient fulness in the *Photographic News*, 1885, p. 244.

MARCH 10TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From the AUTHOR.—Biographical Sketch of James Aitken Meigs, M.D. By George Hamilton, M.D.
— Estudio Prehistórico sobre la Cueva del Tesoro. By Eduardo J. Navarro.
From the GERMAN ANTHROPOLOGICAL SOCIETY.—Correspondenz-Blatt. 1885, Nos. 1, 2.
From the ACADEMY.—Atti della Reale Accademia dei Lincei. Serie Quarta, Vol. I, Fas. 5.
From the ASSOCIATION.—Proceedings of the Geologists' Association. Vol. IX, No. 1. Title-page and Index to Vol. VIII.
From the SOCIETY.—Proceedings of the Royal Society. No. 235.
— Bulletins de la Société d'Anthropologie de Paris. 1884, Fas. 4.
— Journal of the Society of Arts. 1685.
— Journal of the Asiatic Society of Bengal. Vol. LII, Part 2.
— Proceedings of the Asiatic Society of Bengal. November, 1884.
From the EDITOR.—“Science,” Nos. 106, 107.
— “Nature,” Nos. 800, 801.
— “Knowledge,” No. 175.
— Revue Scientifique. Tom. XXXV, Nos. 9, 10.
— Revue Politique. Tom. XXXV, Nos. 9, 10.
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The election of GEORGE FRANCIS LEGG, Esq., was announced.

The following paper was read by the author:—

*On CERTAIN BURIAL CUSTOMS as illustrative of the PRIMITIVE THEORY of the SOUL.*¹

By JAMES G. FRAZER, Esq., M.A.

IN his "Roman Questions,"² that delightful storehouse of old-world lore, Plutarch asks—"When a man who has been falsely reported to have died abroad, returns home alive, why is he not admitted by the door, but gets up on the tiles and so lets himself down into the house?" The curious custom to which Plutarch here refers prevails in modern Persia, for we read in "Hajji Baba" (c. 18) of the man who went through "the ceremony of making his entrance over the roof, instead of through the door; for such is the custom when a man who has been thought dead returns home alive." From a passage in Agathias we may perhaps infer that the custom is at least as old as the sixth century of our era.³ A custom so remote from our modern ways must necessarily have its roots far back in the history of our race. Imagine a modern Englishman, whom his friends had given up for dead, rejoining the home circle by coming down the chimney, instead of entering by the front door. In this paper I propose to show that the custom originated in certain primitive beliefs and observances touching the dead—beliefs and observances by no means confined to Greece and Rome, but occurring in similar if not identical forms in many parts of the world.

The importance attached by the Romans in common with most other nations to the due performance of burial rites is well known, and need not be insisted upon. For the sake of my argument, however, it is necessary to point out that the attentions bestowed on the dead sprang not so much from the affections as from the fears of the survivors. For, as every one knows, ghosts of the unburied dead haunt the earth and make themselves exceedingly disagreeable, especially to their undutiful relatives. Instances would be superfluous; it is the way of

¹ Some additions have been made to the paper as read on March 10th.

² No. 5. It is to be observed that the explanations which I give of many of the following customs are not the explanations offered by the people who practise these customs. Sometimes people give no explanation of their customs, sometimes (much oftener than not) a wrong one. The reader is therefore to understand that the authorities referred to are quoted for the fact of the customs, not for their explanation.

³ Agathias ii, 23. A man grievously sick was exposed in a desert place, and if he recovered and came home he was shunned as a ghost by every one till he had been purified by the Magi, and had, as it were, come back to life (*οἷον ἀνταπολάβει τὸ αὐτὸς βίαιαι*).

ghosts all the world over from Brittany to Samoa.¹ But burial by itself was by no means a sufficient safeguard against the return of the ghost; many other precautions were taken by primitive man for the purpose of excluding or barring the importunate dead. Some of these precautions I will now enumerate. They exhibit an ingenuity and fertility of resource worthy of a better cause.

In the first place an appeal was made to the better feelings of the ghost. He was requested to go quietly to the grave, and at the grave he was requested to stay there.²

But to meet the possible case of hardened ghosts, upon whom moral persuasion would be thrown away, more energetic measures were resorted to. Thus among the South Slavonians and Bohemians, the bereaved family, returning from the grave, pelted the ghost of their deceased relative with sticks, stones, and hot coals.³ The Chuwashé, a tribe in Finnland, had not even the decency to wait till he was fairly in the grave, but opened fire on him as soon as the coffin was outside the house.⁴ The Jewish missiles are potsherds before, and clods after, the burial.⁵

Again, heavy stones were piled on his grave to keep him down, on the principle of "*sit tibi terra gravis*." This is the origin of funeral cairns and tombstones. As the ghosts of murderers and their victims are especially restless, every one who passes their graves in Arabia, in Germany, and in Spain is bound to add a stone to the pile. In Oldenburg (and no doubt elsewhere) if the grave is shallow the ghost will certainly walk.⁶

One of the most striking ways of keeping down the dead man is to divert the course of a river, bury him in its bed, and then allow the river to resume its course. It was thus that Alaric was buried, and Commander Cameron found the same mode of

¹ Sebillot, "Traditions et Superstitions de la Haute-Bretagne," I, p. 238; Turner, "Samoa," p. 150. The Annamese and Hindus particularly dread the ghosts of the unburied dead (J. G. Scott, "France and Tongking," p. 99; Monier Williams, "Religious Thought and Life in India," p. 239 *seqq.*).

² J. H. Gray, "China," I, pp. 300, 304. Similarly the Dacotahs address the ghost begging him to remain in his own place and not disturb his friends (Schoolcraft, "Indian Tribes," V, p. 65). The Karieng address their dead in like manner (Pallegoix, "Description du Royaume Thai ou Siam," I, p. 58).

³ Ralston, "Songs of the Russian People," p. 319; A. Bastian, "Der Mensch in der Geschichte," II, p. 329. Cf. K. Schwenk, "Slawische Mythologie," p. 325.

⁴ Castrén, "Vorlesungen über die finnische Mythologie," p. 120.

⁵ Buxtorf, "Synagoga Judaica," p. 701 *seqq.*; Bodenschatz, "Kirchliche Verfassung der heutigen Juden," iv, pp. 173, 175.

⁶ W. Sonntag, "Todtenbestattung," p. 197; Brand, "Popular Antiquities," II, p. 309; Wuttke, "Deutscher Aberglaube," § 754, cf., 739, 748, 756, 758, 761; Klemm, "Culturgeschichte," II, p. 225; Waitz, "Anthropologie der Naturvölker," II, pp. 195, 324, 325, 524; *ib.* III, p. 202; Ratzel, "Völkerkunde," I, p. 74; K. Weinhold, "Altnordisches Leben," p. 488; L. Strackerjan, "Aberglaube und Sagen aus dem Herzogthum Oldenburg," I, p. 154.

burial still in vogue for chiefs amongst a tribe of Central Africa. Du Chaillu was informed that the Obongos, a dwarf tribe of negroes on the Equator, sometimes bury their dead thus.¹

The expedient of enclosing the grave with a fence too high for the ghost to "take" it, especially without a run, is common to the Finlanders and the Dyaks.²

Another simple but effectual plan is to nail the dead man to the coffin (the Chuwashé again)³ or to tie his feet together (among the Arabs), or his hands together (in Voigtland),⁴ or his neck to his legs (among the Troglodytes, Damaras, and New Zealanders).⁵ The Wallachians drive a long nail through the skull and lay the thorny stem of a wild rose bush on the shroud.⁶ The Californians and Damaras clinched matters by breaking his spine.⁷ The corpses of suicides and vampires had stakes run through them.⁸ Sometimes the heads of vampires are cut off,⁹ or their hearts torn out and hacked in pieces, and their bodies burned,¹⁰ or boiling water and vinegar are poured on their graves.¹¹

Other mutilations of the dead were intended not so much to keep the dead man in his grave as to render his ghost harmless. Thus the Australians cut off the right thumb of a slain enemy, that his ghost might not be able to draw the bow,¹² and Greek murderers used to hack off the extremities of their victims with a similar object.¹³

Again, various steps are taken to chase away the lingering ghost from the home he loves too well. Thus, the New Zealanders thrash the corpse in order to hasten the departure

¹ Jordanes, "Getica," c. xxx, § 158; Cameron, "Across Africa," I, p. 110; Du Chaillu, "A Journey to Ashango-land," p. 321.

² Castren, *op. cit.*, p. 121; Bastian, "Mensch," II, p. 368.

³ Bastian, *ib.* p. 337; likewise the Cheremissé (*ib.* p. 365). The modern Greeks sometimes resort to this practice, but only after a ghost has proved himself troublesome (B. Schmidt, "Das Volksleben der Neugriechen," p. 167, *seq.*).

⁴ Köhler, "Volksbrauch im Voigtland," p. 251.

⁵ Strabo xvi, c. 4, 17; Diodorus Siculus iii, 33; J. G. Wood, "Natural History of Man," I, p. 348; Yate, "New Zealand," p. 136. The Burmese tie together the two big toes, and usually also the two thumbs of the corpse ("The Burman: his Life and Notions," by Shway Yoe [J. G. Scott], II, p. 338; C. J. F. S. Forbes, "British Burma," p. 93).

⁶ Schott, "Wallachische Märchen," p. 298; H. F. Tozer, "Researches in the Highlands of Turkey," II, p. 92.

⁷ Bastian, "Mensch," II, p. 331; C. J. Andersson, "Lake Ngami," p. 226.

⁸ Bastian, II, p. 365; Ralston, "Songs of the Russian People," p. 413.

⁹ Tettau und Temmè, "Die Volkssagen Ostpreussens, Litthauens und Westpreussens," p. 275, *seq.*; Wuttke, "Deutscher Aberglaube," § 765; Töppen, "Aberglauben aus Masuren," p. 114.

¹⁰ B. Schmidt, *loc. cit.*

¹¹ J. T. Bent, "The Cyclades," p. 45.

¹² Tylor, "Primitive Culture," I, p. 451.

¹³ Suidas, *s.v.* μασχαλίσθηναι, μασχαλίσματα.

of the soul;¹ the Algonkins beat the walls of the death-chamber with sticks to drive out the ghost;² the Chinese knock on the floor with a hammer;³ and the Germans wave towels about or sweep the ghost out with a besom,⁴ just as in old Rome the heir solemnly swept out the ghost of his predecessor with a broom made specially for the purpose.⁵ Amongst the Battas in Sumatra the priest officiates as ghost-sweeper, and he is helped by the female mourners.⁶ In modern Greece, as soon as the corpse is out of the house, the whole house is scoured.⁷ In Madagascar when it rains heavily the people beat the walls of their houses violently, in order to drive out the ghosts who may be taking shelter from the inclemency of the weather.⁸ In Scotland and Germany when the coffin was lifted up the chairs on which it had rested were carefully turned upside-down, in case the ghost might be sitting on them.⁹ The Kakhyens in Northern Burma, on the Chinese frontier, dance the ghost out of the house, accelerating his departure by a liberal application of stick.¹⁰ In ancient Mexico certain professional men were employed, who searched the house diligently till they found the lurking ghost of the late proprietor, whom they there and then summarily ejected.¹¹ In Siberia they give the ghost forty days' "law"; after which, if he is still hanging about, the shaman (medicine-man) hunts him out and drums him down to hell. To prevent the possibility of a mistake the shaman conducts the lost soul personally to the lower regions and secures him a favourable reception by standing brandy to the devils all round.¹²

¹ Yate, "New Zealand," p. 136; Polack, "Manners and Customs of the New Zealanders," I, p. 69.

² Brinton, "Myths of the New World," p. 255; "Relations des Jésuites," 1634, p. 23 (Canadian reprint).

³ Gray, "China," I, p. 280.

⁴ Wuttke, "Deutscher Aberglaube," §§ 725, 737; F. Schmidt, "Sitten und Gebräuche bei Hochzeiten, Taufen und Begräbnissen in Thüringen," p. 85; Köhler, "Volksbrauch, &c., im Voigtlande," p. 254.

⁵ Festus, s.v. *everriator*.

⁶ Marsden, "History of Sumatra," p. 388.

⁷ C. Wachsmuth, "Das alte Griechenland im neuen," p. 120; J. T. Bent, "The Cyclades," p. 45.

⁸ H. W. Little, "Madagascar, its History and People," p. 84.

⁹ "Folk-lore Record," II, p. 214; Wuttke, "Deutscher Aberglaube," § 737; Köhler, *loc. cit.*; F. Schmidt, "Sitten und Gebräuche," &c., p. 92; Kuhn und Schwartz, "Norddeutsche Sagen, Märchen und Gebräuche," p. 435 *seq.*

¹⁰ J. Anderson, "Mandalay to Momien," p. 77 *seq.* This death-dance was witnessed by Dr. Anderson and his companion, Col. Sladen. Indeed, by special invitation the learned doctor and the gallant colonel joined in the lugubrious dance and exerted themselves to such good purpose that after two turns the ghost fairly took to his heels and bolted out of the house, hotly pursued by the *premier danseur* with a stick.

¹¹ H. H. Bancroft, "Native Races of the Pacific States of North America," I, p. 641.

¹² W. Radloff, "Aus Siberien," II, p. 52 *seq.*

In North Germany, if a ghost persistently intrudes on your premises, you can get rid of him very simply. You have only to throw a sack over him, and having thus bagged him to walk off with your sack to some other place (as a rule the back garden of a neighbour is selected) and there empty it out, having first clearly explained to the ghost the exact bounds which you wish him to keep. Of course no sooner is your back turned than the ghost starts for home too. His plan is to jump on the back of the first person he sees and ride him in, but when he comes to the boundary, off he falls; and so it goes on, the ghost falling off and jumping on again most gamely, to all eternity. I nearly forgot to say that you had better not try to sack a ghost unless you have been born on a Sunday night between eleven and twelve o'clock.¹

The favourite haunt of the ghost is usually the spot where he died. Hence in order to keep him at least from the house it has been a common practice to carry dying persons to lonely places and leave them there; but if the man dies in the house, it is deserted and left to its ghostly tenant. Thus the Kaffirs carry a sick man out into the open air to die, and the Maoris and Esquimaux remove their sick into special sheds or huts. If a Kaffir or Maori dies before he can be carried out the house is tabooed and deserted. If an Esquimaux is present at the death of a relative he has to throw away his clothes and never use them again.² The Bakalai in Central Africa drive sick people from the village, but if several people should happen to die in the village it is deserted.³ Amongst the Balondas, when a chief or his principal wife dies, the village is deserted; but when an ordinary man dies it is only his house which is abandoned.⁴ In England up to the end of last century it was a common practice to shut up a room in which a member of the family had died.⁵ Amongst the Damaras, when a chief dies, the tribe deserts the neighbourhood; but after a time they return, the new chief offers sacrifice at the grave of his predecessor, and the village is occupied as before.⁶ After a death the Andaman Islanders

¹ Kuhn und Schwartz, "Norddeutsche Sagen, Märchen und Gebräuche," p. 120.

² Lichtenstein, "Travels in Southern Africa," I, pp. 258, 259; J. Campbell, "Travels in South Africa," p. 515 *seq.*; G. Fritsch, "Die Eingeborenen Süd-Afrika's," p. 116; R. Taylor, "*Te ika a mau*," or, New Zealand and its inhabitants," p. 170; Yate, "New Zealand," p. 86; J. G. Wood, "Natural History of Man," II, p. 719.

³ Du Chaillu, "Equatorial Africa," pp. 384, 385. So with the Ashira, *ib.* p. 413.

⁴ Wood, "Natural History of Man," I, p. 419.

⁵ Dyer, "English Folk-lore," p. 231.

⁶ G. Fritsch, "Die Eingeborenen Süd-Afrika's," p. 236; Wood, "Natural History of Man," I, p. 349.

migrate temporarily to a new camping ground.¹ The Altaians in Siberia make a practical distinction between a hut which is portable (a felt hut) and one which is not so (a hut of bark or wood). After a death they abandon the latter, but carry the former away with them after it has been purified by the shaman.² In Panama and Darien they send the sick into the woods, just as in Persia they sent them into the wilderness, to die.³ In Madagascar no one except the sovereign is allowed if ill to stay within the palace.⁴ There are traces in Greece, Rome, China, and Corea of this custom of carrying dying persons out of the house.⁵

But in case the ghost should, despite of all precautions, make his way back from the grave, steps were taken to barricade the house against him. Thus in some parts of Russia and East Prussia an axe or a lock is laid on the threshold, or a knife is hung over the door,⁶ and in Germany as soon as the coffin is carried out of the house all the doors and windows are shut, whereas so long as the body is still in the house the windows (and sometimes the doors) are left open to allow the soul to escape.⁷ In some parts of England every bolt and lock in the house is unfastened, that the ghost of the dying man may fly freely away.⁸

But if primitive man knew how to bully he also knew how to outwit the ghost. For example, a ghost can only find his way

¹ E. H. Man, "Aboriginal Inhabitants of the Andaman Islands," pp. 74, 77.

² Radloff, "Aus Siberien," I, p. 321. Cf. Klemm, "Culturgeschichte," III, p. 174. On the huts, see Radloff, p. 267 *sqq.*

³ Bancroft, "Native Races of the Pacific States," I, p. 781; Agathias, ii, 23.

⁴ Ellis, "History of Madagascar," I, p. 242.

⁵ Euripides, "Alcestis," v. 234 *sqq.* cf. 205; Scholiast on Aristophanes, "Lysistrata," v. 611; Seneca, "Epist.," I, xii, 3; Gray, "China," I, p. 279. In modern Greece the corpse is laid out in the entrance hall (Wachsmuth, "Das alte Griechenland im neuen," p. 108). In Corea no one is allowed to die on the kang (ordinary sleeping place), but is placed on a board (J. Ross, "History of Corea," p. 321).

⁶ Ralston, "Songs of the Russian People," p. 318; Wuttke, "Deutsche Aberglaube," §§ 736, 766; Töppen, "Aberglaube aus Masuren," p. 108.

⁷ Rochholz, "Deutscher Glaube und Brauch," I, p. 171; Schleicher, "Volks-thümliches aus Sonnenberg," p. 152; Sonntag, "Todtenbestattung," p. 169; Wuttke, §§ 737, 725; Gubernatis, "Storia comparata degli usi funebri in Italia e presso gli altri popoli Indo-Europei," p. 47; G. Lammert, "Volksmedizin und medizinischer Aberglaube in Bayern," pp. 103, 105, 106; F. Schmidt, "Sitten und Gebräuche," pp. 85, 92; Strackerjan, "Aberglaube und Sagen aus dem Herzogthum Oldenburg," II, p. 129; Tettau und Temme, "Volksagen," p. 285; A. Kuhn, "Märkische Sagen und Märchen," p. 367; Nork, "Die Sitten und Gebräuche der Deutschen und ihrer Nachbarvölker," pp. 479, 482; Köhler, *op. cit.*, pp. 251, 254; F. Panzer, "Beitrag zur deutschen Mythologie," I, p. 263; Kuhn und Schwartz, *op. cit.*, p. 435. In Masuren, on the other hand, the doors and windows are left open for some time after the corpse has been carried out in case the ghost may be lingering in the house (Töppen, "Aberglauben aus Masuren," p. 108).

⁸ Dyer, "English Folk-lore," p. 230; Brand, "Popular Antiquities," II, p. 231. Cf. Henderson, "Folk-lore of the Northern Counties," pp. 53, 56 *seq.*

back to the house by the way by which he left it.¹ This little weakness did not escape the vigilance of our ancestors, and they took their measures accordingly. The coffin was carried out of the house, not by the door, but by a hole made for the purpose in the wall, and this hole was carefully stopped up as soon as the body had been passed through; so that when the ghost strolled quietly back from the grave, he found, to his surprise, that there was no thoroughfare. The credit of this ingenious device is shared by Greenlanders, Norsemen, Hottentots, Bechuanas, Samoiads, Ojibways, Algonkins, Laosians, Hindoos, Tibetans, Siamese, Chinese, Balinese, and Fijians. These special openings, or "doors of the dead," are still to be seen in a village near Amsterdam, and they were common in some towns of Central Italy, as Perugia and Assisi.² In Lao this mode of exit is reserved for the bodies of women dying in childbirth,³ the reason for which is apparent from the belief of the neighbouring Kakhyens that the ghosts of such women are changed into fearful vampires⁴—a villainous conceit very different from the knightly courtesy of the Aztecs, who allowed the souls of women who died in child-bed to take their places side by side with the brave who died in battle in the better land.⁵ A trace of the same custom survives in Thüringen, where it is thought that the ghost of a man who has been hanged will return to the house

¹ For a similar reason you should never move a sleeper's body, for if you do the absent soul on its return will not be able to find its way back into the body and the sleeper will wake no more. See Strackerjan, "Aberglaube und Sagen aus dem Herzogthum Oldenburg," I, p. 378; *ib.* II, p. 114; Wuttke, "Deutscher Aberglaube," § 60; Köhler, "Volksbrauch im Voigtland," p. 501; Grohmann, "Aberglauben und Bräuche aus Böhmen und Mähren," p. 60.

² Yule on Marco Polo, I, p. 188; Crantz, "Greenland," I, p. 237; Weinhold, "Altnordisches Leben," p. 476; Tylor, "Prim. Cult.," II, p. 26; Waitz, III, p. 199; Fritsch, "Die Eingeborenen Süd-Afrika's," p. 335; Thunberg's "Account of the Cape of Good Hope," in Pinkerton's "Voyages and Travels," xvi, p. 142; Moffat, in Gardner, "Faiths of the World," I, p. 939; Bastian, "Mensch," II, p. 322; Klemm, "Culturgeschichte," II, pp. 221, 225; *ib.* III, p. 293; Sonntag, "Totdenbestattung," p. 51; "Relations des Jésuites," 1634, p. 23; Brinton, "Myths of the New World," p. 255; T. Williams, "Fiji and the Fijians," I, p. 197 (ed. 1860); C. J. Andersson, "Lake Ngami," p. 466; Gubernatis, "Usi funebri," p. 52; C. Bock, "Temples and Elephants," p. 262; Pallegoix, "Description du Royaume Thai ou Siam," I, p. 245; Bowring, "Kingdom and People of Siam," I, p. 222; J. Crawford, "History of the Indian Archipelago," II, p. 245; Lafitau, "Mœurs des Sauvages Américains," II, p. 401. An extraordinary variation of this custom is seen amongst the Jollofs on the Gambia, who break down the whole fence before they carry the dead out of the house (A. B. Ellis, "The Land of Fetish," p. 13). A dead Pope is carried out by a special door, which is then blocked up till the next Pope dies.

³ C. Bock, *loc. cit.* Strictly speaking the body is taken out through a hole in the floor, for houses in Lao are built on posts at a height of five to eight feet from the ground (Bock, *op. cit.*, p. 304).

⁴ J. Anderson, "Mandalay to Momien," p. 145.

⁵ Brinton, "Myths of the New World," p. 263; Bancroft, "Native Races," III, p. 533.

if the body be not taken out by a window instead of the door.¹ In Burma the dead are carried out of a town by a gate reserved for the purpose.² The Siamese, not content with carrying the dead man out by a special opening, endeavour to make assurance doubly sure by hurrying him three times round the house at full speed—a proceeding well calculated to bewilder the poor soul in the coffin.³

The Araucanians adopt the plan of strewing ashes behind the coffin as it is being borne to the grave, in order that the ghost may not be able to find his way back.⁴ With a like intent the Kakhyens returning from the grave scatter rice along the path.⁵ The Tonga Islanders strewed sand about the grave.⁶

The very general practice of closing the eyes of the dead appears to have originated with a similar object; it was a mode of blindfolding the dead, that he might not see the way by which he was carried to his last home. At the grave, where he was to rest for ever, there was of course no motive for concealment; hence the Romans,⁷ and apparently the Siamese,⁸ opened the eyes of the dead man at the funeral pyre, just as we should unbandage the eyes of an enemy after conducting him to his destination. In Nuremburg the eyes of the corpse were actually bandaged with a wet cloth.⁹ In Corea they put blinkers, or rather blinders, on his eyes; they are made of black silk, and are tied with strings at the back of his head.¹⁰ The Jews put a potsherd and the Russians coins on each of his eyes.¹¹ The notion that if the eyes of the dead be not closed his ghost will return to fetch away another of the household, still exists in Bohemia, Germany, and England.¹²

¹ Wuttke, § 756; Schleicher, p. 152. It was an old German law that the corpses of criminals and suicides should be carried out through a hole under the threshold (Grimm, "*Deutsche Rechtsalterthümer*," p. 726 *sqq.*).

² "The Burman," by Shway Yoe, II, p. 342.

³ Pallegoix and Bowring as above. In some parts of Scotland and Germany the corpse used to be carried three times round the church (C. Rogers, "*Social Life in Scotland*," I, p. 167; Rochholz, I, p. 198).

⁴ Klemm, "*Culturgeschichte*," V, p. 51; Wood, "*Nat. Hist. of Man*," II, p. 565.

⁵ J. Anderson, "*Mandalay to Momien*," p. 144.

⁶ Mariner, "*Tonga Islands*, I, p. 392.

⁷ Pliny, "*Nat. Hist.*," xi, § 150. The reason assigned by Pliny is that the dead should be seen for the last time not by man but by heaven.

⁸ C. Bock saw that the eyes of a dead man at the pyre were open (in Siam), and he says that in Lao (in Northern Siam) it is the custom to close the eyes of the corpse ("*Temples and Elephants*," pp. 58, 261).

⁹ Lammert, "*Volksmedizin*," p. 103.

¹⁰ J. Ross, "*History of Corea*," p. 325.

¹¹ Bodenschatz, "*Kirchliche Verfassung der heutigen Juden*," iv, p. 174; Gubernatis, "*Usi Funebri*," p. 50; Kalston, "*Songs of the Russian People*," p. 316.

¹² J. V. Grohmann, "*Aberglaube*," &c., p. 188; Lammert, "*Volksmedizin*," p. 106; Wuttke, § 725; Dyer, "*English Folk-lore*," p. 230; Schleicher, "*Volksthümliches aus Sonnenberg*," p. 152; Rochholz, "*Deutscher Glaube und Brauch*," I, p. 196.

With a similar object, the corpse is carried out of the house feet foremost, for if he were carried out head foremost his eyes would be towards the door and he might find his way back. This custom is observed and this reason is assigned for it in many parts of Germany and among the Indians of Chile.¹ Conversely in Persia when a man is setting out on a journey he steps out of the house with his face turned towards the door, hoping thereby to secure a safe return.² In Thüringen and some parts of the North of England it used to be the custom to carry the body to the grave by a roundabout way.³ In Voigtland there are special "church roads" for carrying the dead to the graveyard; a corpse is never carried along the high road.⁴ In Madagascar no corpse is allowed to be carried along the high road or chief thoroughfare of the capital.⁵ In Burma a corpse is never carried towards the centre of a town, much less taken into it; if a man dies in the jungle and the funeral has to pass a village it skirts the outside of it.⁶ The Chinese are not allowed to carry a corpse within the gates of a walled city.⁷

I venture to conjecture that the old Hawaiian, Roman, German, and Mandingo practice of burying by night⁸ or in the dusk may have originally been intended, like the customs I have mentioned, to keep the way to the grave a secret from the dead man, and it is possible that the same idea gave rise to the practice of masking the dead—a practice common to the prehistoric inhabitants of Greece and to the Aleutian Islanders.⁹ The Aztecs masked their dead kings, and the Siamese do so still.¹⁰ Among the Shans the face of a dead chief is invariably covered with a mask of gold or silver.¹¹

¹ Wuttke, "Deutscher Aberglaube," § 736; Klemm, "Culturgeschichte," II, p. 101. On the other hand, in modern Egypt the corpse is carried out head foremost (Lane, "Manners and Customs of the Modern Egyptians," II, p. 291, *ed.* 1836.

² Monier's "Hajji Baba," c. i, *fin.*

³ F. Schmidt, "Sitten und Gebräuche in Thüringen," p. 94. The English custom was verbally communicated to me.

⁴ Köhler, "Volksbrauch im Voigtland," p. 258.

⁵ Ellis, "History of Madagascar," I, p. 241.

⁶ "The Burman: his Life and Notions," by Shway Yoe, II, p. 342 *seq.*

⁷ Gray, "China," I, p. 323.

⁸ Ellis, "Polynesian Researches," IV, p. 361 (*cf.* Cook's "Voyages," VII, p. 149 *seq.*, *ed.* 1809); Servius on Virgil, "Æn.," I, p. 186; F. Schmidt, *loc. cit.*; Mungo Park, "Travels in the Interior Districts of Africa," p. 414. Night burial was sometimes practised in Scotland (C. Rogers, "Social Life in Scotland," I, p. 161). In Benguela (West Africa) the corpse is burned at sundown (Waitz, "Anthropologie," II, p. 196).

⁹ Schliemann, "Mycenæ," pp. 198, 219-223, 311 *seq.*; Baneroff, "Native Races of the Pacific States," I, p. 93. *Cf.* Miss A. W. Buckland in vol. xiv, p. 229, of this Journal. I regret that I have not seen the standard work of Benndorf, "Antike Gesichtshelme und Sepulcralmasken," Wien 1878.

¹⁰ Baneroff, "Native Races," II, p. 606; Pallegoix, "Siam," I, p. 247.

¹¹ A. S. Colquhoun, "Amongst the Shans," p. 279.

To a desire to deceive the dead man I would also refer the curious custom amongst the Bohemians of putting on masks and behaving in a strange way as they returned from a burial.¹ They hoped, in fact, so to disguise themselves that the dead man might not know and therefore might not follow them. Whether the widespread mourning customs of smearing the body with ashes, mud, or paint, mutilating it by gashes, cutting off the hair or letting it grow, and putting on beggarly attire or clothes of an unusual colour (black, white, or otherwise), may not also have originated in the desire to disguise and therefore protect the living from the dead, I cannot here attempt to determine.² This much is certain, that mourning customs are always as far as possible the reverse of those of ordinary life. Thus at a Roman funeral the sons of the deceased walked with their heads covered, the daughters with their heads uncovered, thus exactly reversing the ordinary usage, which was that women wore coverings on their heads while men did not. Plutarch, who notes this, observes that similarly in Greece men and women during a period of mourning exactly inverted their usual habits of wearing the hair—the ordinary practice of men being to cut it short, that of women to wear it long.³

The objection, deeply rooted in many races, to utter the names of deceased persons,⁴ sprang no doubt from a fear that the dead might hear and answer to his name. In East Prussia if the deceased is called thrice by his name he appears.⁵ This reluctance to mention the names of the dead has modified whole languages. Thus among the Australians, Tasmanians, and Abipones, if the name of a deceased person happened to be a common name, *e.g.*, the name of an animal or plant, this name was abolished and a new one substituted for it.⁶ During the residence of the Jesuit missionary Dobritzhofer amongst the Abipones, the name for tiger was thus changed three times.⁷ Amongst the Indians of Columbia near relatives of the deceased often change their names, in the belief that the ghost will return if he hears the familiar names.⁸

¹ Bastian, "Der Mensch in der Geschichte," II, p. 328.

² See note I at end.

³ Plutarch, "Quæstiones Romanæ," p. 14.

⁴ Tylor, "Early History of Mankind," p. 142. Amongst some Indian tribes of North America whoever mentions a dead man's name may be compelled to pay a heavy fine to the relatives (Bancroft, "Native Races," I, p. 357, note).

⁵ Wuttke, "Deutscher Aberglaube," § 754.

⁶ Tylor, *op. cit.*, p. 144 *sqq.*

⁷ Klemm, "Culturgeschichte," II, p. 99; Dobritzhofer, "The Abipones," II, p. 208 *sqq.*

⁸ Bancroft, "Native Races," I, p. 248. Cf. Waitz, "Anthropologie," VI, p. 811. When a survivor bears the same name as the deceased he drops it during the time of mourning (Charlevoix, "Journal Historique d'un Voyage dans

While no pains were spared to prevent the dead man from returning from the grave, on the other hand precautions were taken that he should not miss the way to it. The kings of Michoacan were buried at dead of night, but the funeral train was attended by torch-bearers and preceded by men who swept the road, crying, "Lord, here thou hast to pass, see that thou dost not miss the way."¹ In many Wallachian villages no burial takes place before midday, because the people believe that if the body were buried before noon the soul might lose its way and never reach its place of rest. But if it is buried in the afternoon they think that the sun, descending to his rest, will guide the tired spirit to its narrow bed.²

"Soles occidere et redire possunt:
Nobis cum semel occidit brevis lux,
Nox est perpetua una dormienda."

I must pass lightly over the kindlier modes of barring the dead by providing for the personal comforts of the poor ghost in his long home. That the dead still think and feel in the grave is a very old opinion, the existence of which is attested by many customs as well as by the evidence of the poets, those lovers of the past, and by no poet more vividly than by Heine, where he tells us how the French grenadier lies in his quiet grave, listening, listening, till his ear catches the far-off thunder of the guns, and with a clatter of horse-hoofs and clash of steel the cavalry rides over his grave. Hades, or the common abode of all the dead, whether beneath the earth or in a far island of the sea, is probably the later dream of some barbaric philosopher, some forgotten Plato; and the partition of Hades into heaven and hell is certainly the latest, as it is possibly the last, development of the belief in a life hereafter.³

The nearly universal practice of leaving food on the tomb or of actually passing it into the grave by means of an aperture or tube is too well known to need illustration. Like the habit of dressing the dead in his best clothes,⁴ it probably originated in

l'Amérique Septentrionale, II, p. 109; Lafitau, *Mœurs des Sauvages Américains*, II, p. 434).

¹ Baneroff, II, p. 621. Cf. Charlevoix, *op. cit.*, p. 107.

² Schott, "Wallachische Mährchen," p. 302. The custom is perhaps a relic of night burial. The reason assigned for it is too beautiful to be old. In Russia also the sun is regarded as *ψυχοποιός*; but it is apparently enough if the burial takes place by daylight (Ralston, "Songs of the Russian People," p. 319).

³ It is interesting to find the three strata of belief still clearly existing side by side in modern Greece. See B. Schmidt, "Das Volksleben der Neugriechen," p. 235 *sqq.*

⁴ Charlevoix, "Journal Historique," II, p. 107; W. Radloff, "Aus Siberien," I, pp. 321, 379; Spenser St. John, "Life in the Forests of the Far East," I, p. 57; Klemm, "Culturgeschichte," II, pp. 104, 225; *ib.* IV, p. 38; J. G. Scott, "France and Tongking," p. 97; Schoolcraft, "Indian Tribes," II, p. 68; *ib.* IV, 54; Wood, "Natural History of Man," I, p. 562; *ib.* II, 190, 512, 542;

the selfish but not unkindly desire to induce the perturbed spirit to rest in the grave and not come plaguing the living for food and raiment.¹ One instance, however, of the minute care with which the survivors will provide for the wants of the departed, in order that he may have no possible excuse for returning, I cannot refrain from mentioning. In the Saxon district of Voigtland, with its inclement sky, people have been known to place in the coffin an umbrella and a pair of goloshes.² Whether these utensils are meant for use in heaven or elsewhere is a question which I must leave to theologians.

A pathetic example is furnished by some Indian tribes of New Mexico, who drop milk from the mother's breast on the lips of her dead babe.³ Similarly in Africa we hear of a Myoro woman who bore twins that died; so she kept two little pots to represent the children, and every evening she dropped milk from her own breast into them, lest the spirits of the dead babes should torment her.⁴

In the Mili Islands in the Pacific, after they have committed the body to the earth, they lade a small canoe with cocoa-nuts, hoist a sail, and send it out to sea, hoping that the soul will sail away with the frail bark and return no more.⁵

Bancroft, "Native Races," I, p. 86; "The Burman," by Shway Yoe, II, p. 338; P. Bouche, "La Côte des Esclaves," p. 213; Lafitau, "Mœurs des Sauvages Américains," II, p. 389; Schott, "Wallachische Märchen," p. 302; Wachsmuth, *op. cit.*, p. 108; Taylor, "New Zealand," p. 218; Köhler, "Volksbrauch im Voigtlande," p. 252; Baron's "Description of the Kingdom of Tonqueen," in Pinkerton's "Voyages and Travels," IX, pp. 698, 700, 730. In modern Greece the corpse is arrayed in its best clothes, but at the grave these are entirely destroyed, or at least rendered valueless, by being snipped with scissors or saturated with oil ("Folk-lore Journal," II, p. 168 *seq.*). This may be (as the writer half suggests) a modern precaution against thieves. On the destruction of the property of the dead, see next note.

¹ The fear of the dead, which underlies all these burial customs, may have sprung from the idea that they were angry with the living for dispossessing them. Hence, rather than use the property of the deceased and thereby incur the anger of his ghost, men destroyed it. The ghost would then have no motive for returning to his desolated home. Thus we are told by the careful observer, Mr. G. M. Sprout, that the Ahts of Vancouver's Island "bury a man's personal effects with him, and burn his house, in the fear that if these were used, the ghost would appear and some ill consequences would follow." He adds: "I have not found that any articles are deposited in burying grounds with the notion that they would be useful to the deceased in an after time, with the exception of blankets" ("Scenes and Studies of Savage Life," p. 260). The idea that the souls of the things thus destroyed are despatched to the spirit-land (see Tylor, "Primitive Culture," I, p. 480 *seq.*; and for an additional example of "killing" the things placed in the grave, see H. H. Johnston, "The River Congo," p. 246) is less simple and therefore probably later. For in the evolution of thought as of matter the simplest is the earliest.

² Köhler, "Volksbrauch im Voigtland," p. 441; Wuttke, § 734.

³ Bancroft, I, p. 360; *cf.* III, 543.

⁴ J. H. Speke, "Journal of the Discovery of the Source of the Nile," p. 541.

⁵ Waitz, V, ii, p. 152 *seq.* Gerland remarks that this is a remnant of the

Merely mentioning the customs of building a little hut for the accommodation of the soul, either on the grave or on the way to it,¹ and of leaving straw on the road, in the hope that the weary ghost will sit down on it and never get as far as the house,² I now come to two modes of barring the ghost which, from their importance, I have reserved to the last, I mean the methods of barring the ghost by fire and water.

First, by fire. After a funeral certain heathen Siberians, who greatly fear the dead, seek to get rid of the ghost of the departed by leaping over a fire.³ Similarly, at Rome, mourners returning from a funeral stepped over fire,⁴ and in China they sometimes do so to this day.⁵ Taken in connection with the Siberian custom the original intention of this ceremony of stepping over fire at Rome and in China can hardly have been other than that of placing a barrier of fire between the living and the dead. But, as has been the case with so many other ceremonies, this particular ceremony may well have been practised long after its original intention was forgotten. For customs often live on for ages after the circumstances and modes of thought which gave rise to them have disappeared, and in their new environment new motives are invented to explain them. As might have been expected, the custom itself of stepping over fire often dwindled into a mere shadow of its former self. Thus the South Slavonians returning from a funeral are met by an old woman carrying a vessel of live coals. On these they pour water, or else they take a live coal from the hearth and fling it over their heads.⁶ The Brahmans contented themselves with simply

Polynesian custom of sending the body (as well as the soul) out to sea. Cf. Turner, "Samoa," p. 306. The Norsemen sometimes disposed of their dead thus (Grimm, "Deutsche Mythologie," II, p. 692 *sq.*; Weinhold, *op. cit.*, pp. 479, 483 *sq.*; Rochholz, I, p. 174). The custom of burying the corpse in a canoe or boat is common to the Norsemen, Slavonians, Ostjaks, Indians of the Columbia River, and Polynesians (Grimm, *loc. cit.*; Weinhold, p. 495 *sqq.*; Ralston, *op. cit.*, p. 108; Brinton, "Myths of the New World," p. 265; Bastian, "Mensch," II, p. 331; Waitz, *loc. cit.* and VI, pp. 401, 405, 411).

¹ Chalmers and Gill, "Work and Adventure in New Guinea," p. 56; Klemm, "Culturgeschichte," II, p. 297; Bastian, "Mensch," II, p. 328; Waitz, "Anthropologie," II, p. 195; *ib.* III, p. 202; *ib.* V, ii, p. 153; *ib.* VI, pp. 686, 806, 807; Wood, "Natural History of Man," I, p. 574; Cook's "Voyages," IV, p. 62 *seq.* (ed. 1809); *ib.* I, p. 93 *seq.*; Bosman's "Guinea" in Pinkerton's "Voyages and Travels," XVI, p. 431; J. Leighton Wilson, "Western Africa," p. 171 (German translation); J. Anderson, "Mandalay to Momien," p. 144; Cameron, "Across Africa," I, p. 49; Marco Polo, i, c. 40.

² Wuttke, "Deutscher Aberglaube," § 739; Töppen, "Aberglauben aus Masuren," p. 109.

³ Meiners, "Geschichte der Religionen," II, p. 303.

⁴ Festus, *s.v. aqua et igne*.

⁵ Gray, "China," I, pp. 287, 305.

⁶ Ralston, "Songs of the Russian People," p. 320.

touching fire,¹ and in Ruthenia the mourners merely look steadfastly at the stove or place their hands on it.² The Arabs of old, it may be noted, adopted much the same means to prevent the return of a living man whom they disliked; when he departed they lit a fire behind his back and cursed him.³

So much for the barrier by fire. Next for the barrier by water. The Wends of Geisnitz make a point of passing through running water as they return from a burial; in winter, if the river is frozen, they break the ice in order to wade through the water.⁴ In modern Mytilini and Crete if a man will not rest in his grave they dig up the body, ferry it across to a little island, and bury it there.⁵ The Kythniotes in the Archipelago have a similar custom, except that they do not take the trouble to bury the body a second time, but simply tumble the bones out of a bag and leave them to bleach on the rocks, trusting to the "silver streak" of sea to imprison the ghost.⁶ In many parts of Germany, in modern Greece, and in Cyprus, water is poured out behind the corpse as it is being carried from the house, in the belief that, if the ghost returns, he will not be able to cross it.⁷ Sometimes, by night, the Germans pour holy water before the door; the ghost is then thought to stand and whimper on the further side.⁸ The inability of spirits to cross water might be further illustrated by the Bagman's ghastly story in Apuleius, the Goblin Page in the "Lay of the Last Minstrel," the witch in "Tam O'Shanter," and other instances.⁹

¹ Monier Williams, "Religious Life and Thought in India," pp. 283, 288.

² Ralston, *loc. cit.*

³ D. J. Lassen Rasmussen, "Additamenta ad historiam Arabum ante Islamismum," p. 67.

⁴ K. Haupt, "Sagenbuch der Lausitz," I, p. 254.

⁵ B. Schmidt, "Das Volksleben der Neugriechen," p. 163.

⁶ J. T. Bent, "The Cyclades," p. 441 *seq.*

⁷ A. Kuhn, "Märkische Sagen," p. 368; Temme, "Volksagen der Altmark," p. 77; Nork, "Sitten und Gebräuche der Deutschen und ihrer Nachbarvölker," p. 479; Wuttke, § 737; Rochholz, I, p. 177; Lammert, "Volksmedizin," p. 105; Töppen, "Aberglauben aus Masuren," p. 108; Panzer, "Beitrag zur deutschen Mythologie," I, p. 257; "Folk-lore Journal," II, p. 170; Wachsmuth, "Das alte Griechenland im neuen," p. 119; cf. Tettau und Temme, "Die Volksagen Ostpreussens, Litthauens und Westpreussens," p. 286.

⁸ Wuttke, "Deutscher Aberglaube," § 748; Rochholz, "Deutscher Glaube und Brauch," I, p. 186.

⁹ Apuleius, "Metam.," i, 19, cf. 13; "Lay of the Last Minstrel," iii, 13. Cf. Giraldus Cambrensis, "Topographie of Ireland," c. 19; Grimm, "Deutsche Mythologie," III, p. 434; Theocritus xxiv, 92; Homer, "Odys.," xi, 26 *seq.*; Henderson's "Folk-lore of the Northern Counties," p. 212. Observe that the inability of spirits to cross water is not absolute, but is strictly analogous to that of living men. The souls, like the bodies of men, can cross water by a boat or bridge, or by swimming. For instances of the soul of the sleeper leaving his body and crossing a brook by means of a sword laid across it, see Paulus, "Historia Langobardorum," iii, c. 34; Grimm, "Deutsche Sagen," 451. Again the souls of the dead regularly pass by bridge or boat the River of Death,

Another way of enforcing the water barrier is to plunge into a stream, in the hope of drowning, or, at least, washing off, the

that sombre stream which has flowed in the imagination of so many nations of the world. For evidence see Grimm, "Deutsche Mythologie," p. 692 *sqq.*; K. Simrock, "Handbuch der deutschen Mythologie," p. 255 *sqq.*; Rochholz, "Deutscher Glaube und Brauch," I, p. 173 *sqq.*; Tylor, "Primitive Culture," II, p. 94; Brinton, "Myths of the New World," p. 265 *sqq.*; B. Schmidt, "Das Volksleben der Neugriechen," p. 236 *sqq.*; Sonntag, "Totdenbestattung," p. 164; Bancroft, "Native Races," III, pp. 519, 538, 543; Ralston, "Songs of the Russian People," p. 107; Monier Williams, "Religious Thought and Life in India," p. 290; Dennys, "Folk-lore of China," p. 24. Amongst the Kasi Indians, when the funeral happens to pass a puddle, they lay a straw over it for the soul of the dead man to use as a bridge (Dennys, *loc. cit.*). Polynesian ghosts can swim (Bastian, "Die heilige Sage der Polynesier," p. 52; Turner, "Nineteen Years in Polynesia," p. 235). On the other hand the idea of a journey by land appears in the Norse, German, Prussian, and Californian custom of shoeing the dead (Grimm, "Deutsche Mythologie," II, p. 697; K. Simrock, *op. cit.*, p. 127; K. Weinhold, "Altnordisches Leben," p. 494; Dasent, "Burnt Njal," I, p. cxxii; Rochholz, I, p. 186; Sonntag, "Totdenbestattung," p. 171; Töppen, "Aberglauben aus Masuren," p. 107; Bancroft, "Native Races," I, p. 569; Brinton, "Myths of the New World," p. 250). In Bohemia, on the contrary, no shoes are put in the grave, because, if they were, the ghost would be obliged to walk the earth till they were worn out (Grohmann, "Aberglauben," &c., p. 197). The custom of placing a coin in the mouth of the corpse has prevailed in ancient Greece (Lucian, "De Luctu," 10), ancient Italy (Marquardt, "Das Privatleben der Römer," I, p. 338 *sq.*), amongst the Franks (K. Weinhold, "Altnordisches Leben," p. 493); in modern Greece, Thessaly, Macedonia, Asia Minor (Wachsmuth, "Das alte Griechenland im neuen," p. 117 *sqq.*; B. Schmidt, "Das Volksleben der Neugriechen," p. 236 *sqq.*), Albania (Hahn, "Albanesische Studien," I, p. 151), France (Vrëto, "Mélanges Neohelleniques," p. 30, referred to by B. Schmidt, *loc. cit.*), Germany (Grimm, "Deutsche Mythologie," II, p. 694, *id.* III, p. 441; Wuttke, "Deutscher Aberglaube," § 734; F. Schmidt, "Sitten und Gebräuche in Thüringen," p. 91; Rochholz, I, 189 *sqq.*), Burma (Forbes, "British Burma," p. 93; "The Burman," by Shway Yoe, II, p. 338), Lao (C. Bock, "Temples and Elephants," p. 361), among the Kakhyens (J. Anderson, "Mandalay to Momi," p. 143), in China (Gray, "China," I, p. 281), among the Hindus (Monier Williams, "Religious Thought and Life," p. 296), Madagas of Southern India (Marshall, "Travels among the Todas," p. 172), and in Yucatan (Bancroft, "Native Races," II, p. 800). The idea that this money in the dead man's mouth is to pay the ferry across the River of Death occurs in Italy, Greece, Asia Minor, Germany, Burma, among the Kakhyens, and in Yucatan. In Asior Minor the money is called *παρατίκιον*, in Burma *Kādo ākāh*, both meaning "ferry-money," like the old Greek *ναῦλον*, *πορθήμιον*. (At Komiakè in Naxos the old name *ναῦλον* is still retained, but it is applied, not to a coin, but to a little wax cross placed on the lips of the corpse. Bent, "The Cyclades," p. 363). In Arachoba on Parnassus it is thought to be a bridge-toll, an idea probably imported into Greece by the Turks, as Schmidt suggests. In some parts of Germany the notion is that if the deceased has hidden a treasure the coin in his mouth will prevent him returning. In Lao it is to pay a fine in the spirit-world. The Hindus suppose that it keeps at bay the ghostly ministers of death; hence it is inserted in the mouth of the dying, and to make sure of having it in the hour of need a Hindu in good health will have gold inserted in his teeth. In Corea the mouth of the dead is filled with boiled *whangmi*, three holeless pearls, and a piece of jade (J. Ross, "History of Corea," p. 324 *sq.*). In Tonquin the common people put three grains of rice in the mouth of the corpse; wealthy families put one or more precious stones (J. G. Scott, "France and Tongking," p. 97); Baron tells us that persons of quality put small pieces of gold and silver together with seed pearls, in the belief that this would secure the spirit respect in the other

ghost. Thus among the Matamba negroes a widow is bound hand and foot by the priest, who flings her into the water several times over, with the intention of drowning her husband's ghost, who may be supposed to be clinging to his unfeeling spouse.¹ In Angola, for a similar purpose, widows adopt the less inconvenient practice of ducking their late husbands.² In New Zealand all who have attended a funeral betake themselves to the nearest stream and plunge several times head under, in the water.³ In Fiji the sextons always washed themselves after a burial.⁴ In Tahiti all who had assisted at a burial fled precipitately and plunged into the sea, casting also in the sea the garments they had worn.⁵ All who had helped to bury a king of Michoacan bathed afterwards.⁶ Amongst the Mosquito Indians all persons returning from a funeral undergo a lustration in the river.⁷ In Madagascar the chief mourner returning from the funeral immediately washes himself.⁸ In North Guinea, after a corpse has been buried, the bearers rush to the water and wash themselves thoroughly before they return to the town.⁹

But the barrier by water, like the barrier by fire, often dwindled into a mere stunted survival. Thus, after a Roman funeral it was enough to carry water three times round the persons who had been engaged in it and to sprinkle them with

world and save him from want ("Description of the Kingdom of Tonqueen" in Pinkerton's "Voyages and Travels," ix, p. 698). In China the things inserted in the mouth vary in value with the rank of the deceased; grains of paddy or seeds of three different kinds are sometimes inserted. In Yucatan corn as well as money is put in the mouth. In Wallachia the coin is placed in the hand of the corpse (Schott, "Wallachische Mährchen," p. 302); and so in Masuren, where the dead is at the same time addressed in these words, "Now you have got your pay, so don't come back again" (Töppen, "Aberglauben aus Masuren," p. 108). The Slavonians used to put money in the grave to pay the passage of the spirit across the Sea of Death, and Russian peasants at a funeral still throw small coins into the grave (Ralston, "Songs of the Russian People," p. 107 sq.); the coin is sometimes put in the hand of the corpse (*ib.*, p. 315). The Norsemen also put a piece of money in the grave (Weinhold, *loc. cit.*). The original custom may have been that of placing food in the mouth, for which in after times valuables (money or otherwise) were substituted, that the dead might buy his own food.

¹ Sonntag, "Todtenbestattung," p. 113.

² *ib.*, p. 115.

³ Yate, "New Zealand," p. 137; Taylor, "New Zealand and its Inhabitants," p. 224.

⁴ T. Williams, "Fiji and the Fijians," I, p. 191.

⁵ Ellis, "Polynesian Researches," I, p. 403.

⁶ Bancroft, "Natives Races," II, p. 621.

⁷ *ib.* I, p. 744.

⁸ Ellis, "History of Madagascar," I, p. 238.

⁹ J. L. Wilson, "Western Africa," c. 17 (p. 171 of the German translation. I have not seen the original. The English of this passage is given in Gardner's "Faiths of the World," I, p. 938).

the water.¹ Modern Jews, as they leave the graveyard, wash their hands in a can of water placed at the gate; before they have done so they may not touch anything, nor may they return to their houses.² In modern Greece, Cappadocia, and Crete, persons returning from a funeral wash their hands.³ In Samoa they wash their faces and hands with hot water.⁴ In ancient India it was enough merely to touch water.⁵ In China, on the fifth day after a death, the mourners wash their eyes and sprinkle their faces three times with water.⁶ In ancient Greece, so long as a corpse was in the house a vessel of water stood before the street-door, that all who left the house might sprinkle themselves with it.⁷ Note that in this case the water had to be fetched from another house, water taken from the house in which the corpse lay would not do. The significance of this fact I shall have occasion to point out presently.

When considered along with the facts I have mentioned, it can hardly be doubted that the original intention of this sprinkling with water was to wash off the ghost who might be following from the house of death; and, in general, I think we may lay down the rule that wherever we find a so-called purification by fire or water from pollution contracted by contact with the dead, we may assume with much probability that the original intention was to place a physical barrier of fire or water between the living and the dead, and that the conceptions of pollution and purification are merely the fictions of a later age, invented to explain the purpose of a ceremony of which the original intention was forgotten. The discussion of the wider question, whether all forms of so-called purification may not admit of an analogous explanation, must be reserved for another occasion. Here I will merely point to two kinds of purification which are most obviously explicable on the hypothesis that they are modes of barring spirits. The first of these is the purification for manslaughter. The intention of this ceremony was probably to rid the slayer of the vengeful spirit of the slain, the ghosts of all persons who come by a violent end being especially vicious. In accordance with this view we find purification exacted when the slain man was

¹ Virgil, "*Æneid*," vi, 228. Servius on this passage speaks of carrying fire round similarly.

² Bodenschatz, "*Die Kirchliche Verfassung der heutigen Juden*," iv, p. 175.

³ Wachsmuth, "*Das alte Griechenland im neuen*," p. 120; Bent, "*The Cyclades*," p. 221.

⁴ Turner, "*Samoa*," p. 145.

⁵ Monier Williams, "*Religious Life and Thought in India*," pp. 283, 288.

⁶ Gray, "*China*," I, p. 305.

⁷ Pollux, viii, 65; Hesychius and Suidas, s.v. ἀρδάνιον; cf. Wachsmuth, *op. cit.*, p. 109.

an enemy of the tribe as well as when he was a member of it. Thus when a Pima Indian slays an Apache, he has to undergo a strict and solitary purification in the woods for sixteen days.¹ Similarly, Bechuana warriors returning from battle wash themselves and their weapons with solemn ceremony.² Again, since the savage has no hesitation in deciding affirmatively the question whether animals have souls, purification is found to be practised for the slaughter of beasts as well as of men. Thus a Damara hunter returning successful from the chase takes water in his mouth and ejects it three times over his feet and also in the fire of his own hearth.³ Amongst the Koossa Kaffirs the first man who receives a wound in a fight with a lion is made "unclean" by it, though at the same time he is regarded as a hero. The idea plainly is, that by wounding this man first the lion showed that he had an especial grudge at him, and this grudge the lion's ghost will not be likely to forget. Hence, following the usual Kaffir mode of purification, the man is shut up in a small hut, away from every one else for four days, after which he is purified; and, having now given the slip to the ghost, he is marched back to the village, surrounded by a guard of honour.⁴ My interpretation of this custom will not seem extravagant when we remember the punctilious politeness with which a savage treats the spirits of the beasts he has killed.⁵ The second kind of purification to which I will here refer is the passing of men and cattle through the need-fire during the prevalence of a plague. This custom is explained most simply by supposing that people thereby intended to interpose a barrier between themselves and their cattle on the one side and the maleficent spirits of the plague on the other.⁶ One more kind of purification—that of women after childbirth—will be referred to in the course of this paper.

Such, then, are some of the modes of excluding or barring the ghost. Before quitting the subject, however, I wish to observe that as the essence of these proceedings was simply the erection of a barrier against the disembodied spirit, they might be, and actually were, employed for barring spirits in other connections. Thus, for example, since to early man death means the

¹ Bancroft, "Native Races," I, p. 553. For the enmity of the Pimas and Apaches, see *id.* p. 542.

² G. Fritsch, "Die Eingeborenen Süd-Afrika's," p. 201.

³ C. J. Andersson, "Lake Ngami," p. 224.

⁴ Lichtenstein, "Travels in Southern Africa," I, p. 257 *sq.*

⁵ Tylor "Primitive Culture," I, p. 468 *sq.*

⁶ See Grimm, "Deutsche Mythologie," p. 503, *sqq.*; Tylor, "Early History of Mankind," p. 256 *sq.*; W. Mannhardt, "Der Baumkultus der Germanen und ihrer Nachbarstämme," p. 518 *sqq.*; U. Jahn, "Die deutschen Opfergebräuche bei Ackerbau und Viehzucht," p. 26 *sqq.*

departure of the soul out of the body, it is obvious that the very same proceedings which serve to exclude the soul after it has left the body, *i.e.*, to bar the ghost, may equally well be employed to bar the soul *in* the body, *i.e.*, to prevent its escaping; in other words, they may be employed to prevent a sick man from dying, in fact they may be used as cures. Thus the Chinese attempt to frighten back the soul of a dying man into his body by the utterance of wild cries and the explosion of crackers, while they rush about with extended arms to arrest its progress.¹ The use of water as a cure is perhaps best illustrated by the Circassian treatment of the sick. It is well known that according to primitive man the soul of a sleeper departs from his body to wander far away in dreamland; indeed the only distinction which early man makes between sleep and death is that sleep is a temporary, while death is a permanent absence of the soul. Obviously then, on this view, sleep is highly dangerous to a sick man, for if in sleep his soul departs, how can we be sure that it will come back again? Hence in order to ensure the recovery of a sick man one of the first requisites is to keep him from sleeping. With this intention the Circassians will dance, sing, play, and tell stories to a sick man by the hour. Fifteen to twenty young fellows, naturally selected for the strength of their lungs, will seat themselves round his bed, and make night hideous by singing in chorus at the top of their voices, while from time to time one of them will create an agreeable variety by banging with a hammer on a ploughshare which has been thoughtfully placed for the purpose by the sick man's bed. But if, in spite of these unremitting attentions, the sick man should have the misfortune to fall asleep—mark what follows—they immediately dash water over his face.² The intention of this latter proceeding can hardly be doubtful: it is a last effort to stop the soul about to take flight for ever.³ So among the Abipones, a dying man

¹ Huc, "L'Empire Chinois," II, p. 241 *sqq.*

² Klemm, "Culturgeschichte," IV, p. 34 *sq.*

³ The reason for throwing water on the face is that the soul is usually thought to issue either by the mouth or the nose. The Romans, Franks, Germans, English, Slavonians, Mexicans, and Quichés believed that it issued through the mouth (Ovid, "Met.," xii, 424 *sq.*, where the man is dying of a wound in the breast; Paulus, "Historia Langobardorum," iii, 34; Wuttke, "Deutscher Aberglaube," § 60; Grimm, "Deutsche Mythologie," p. 690 *sq.*; *id.*, "Deutsche Sagen," 461; Dyer, "English Folk-lore," p. 214; Grohmann, "Aberglauben und Gebräuche aus Böhmen und Mähren," pp. 60, 194; Tylor, "Primitive Culture," II, p. 29; Fancroft, "Native Races," III, p. 315, *cf.* II, p. 799). The ancient Greeks believed that the soul issued through the mouth or through a gaping wound (Homer, "Iliad," ix, 409; xiv, 518; xvi, 505; *cf.* Buchholz, "Die Homerischen Realien," II, ii, 284 *sqq.*). The modern Greeks believe that Charos, the Death-god, draws the soul out of the mouth; but if the man is wicked or resists his fate, Charos (so say the Arachobites) cuts open his breast with a sword, for the soul has its seat

is surrounded by a crowd of old crones brandishing rattles, stamping and yelling, while every now and then one of them

under the left breast (B. Schmidt, "Das Volksleben der Neugriechen," p. 228 sq.). The Jews, Arabs, and Battas of Sumatra believe that the soul issues through the nostrils (Bastian, "Mensch," II, p. 322; *id.*, "Die Seele," p. 52; Marsden, "History of Sumatra," p. 386); but if a man dies of a wound, the Arabs (like the Homeric Greeks) believe that the soul escapes through the wound (communicated by Professor Robertson Smith). The Tonquinese used to throw a handkerchief over the face of the dying in order to catch his soul (Richard's "History of Tonquin," in Pinkerton's "Voyages and Travels," ix, p. 730). The modern Tonquinese hang a film of cotton before the nostrils by a silken thread (J. G. Scott, "France and Tongking," p. 96. Mr. Scott supposes that this is to verify the fact of death. It is possible that the old custom may have been thus rationalised). The inhabitants of the Marquesas Islands are apparently of opinion that the soul may pass out indifferently either by the nose or the mouth, for when a man is at his last gasp the nearest relative holds both the nose and the mouth of the dying man with the kind intention of preventing the escape of the soul (Waitz, "Anthropologie," vi, p. 397). Among the Seminoles of Florida, when a mother died in childbirth, the baby was held over her face to receive her parting spirit (Brinton, "Myths of the New World," p. 271). But the soul has other gateways or posterns. The Chuwasché think that it goes out at the back of the head (Bastian, "Mensch," II, p. 322). The Tibetans believe that it issues by the top of the head, but its escape has to be facilitated by cutting off a lock of hair from the crown of the head; this is done by a lama (Orazio della Penna di Billi, "Brief Account of the Kingdom of Tibet," in Bogle and Manning's "Tibet," p. 338 sq.; *cf.* Meiners, "Geschichte der Religionen," II, p. 726 sq.). A similar theory is revealed by the practice of the Kánikárs (a hill tribe of Travancore); when a man is sick to death, his top-knot is cut off by the headman of the village, and his friends then take their last farewell of him (Samuel Mateer, "Native Life in Travancore," p. 68). The Greeks and Romans appear to have had at one time the same belief and custom (Euripides, "Alceste," 74 sqq., 101 sq.; Virgil, "Æneid," iv, 698 sqq.; *cf.* Macrobius, "Saturnus," V, 19. The lock so cut off may be that referred to in "Etymologicon Magnum," s.v. ἀπασκολυνμένοι. κολλῶν γὰρ ἡ θρίξ ἡ ἐπὶ τοῦ ἄκρου, ἣν ἐφύλαττον ἀκούρευτον, θεοῖς ἀνατίθεντες), and we may perhaps say the same of the Canadian Indians, for when one of them died a lock from his head was cut off and presented to the nearest relative ("Relations des Jésuites," 1634, p. 24; *cf.* Lafitau, "Mœurs des Sauvages Américains," II, p. 402). This lock may have been the scalp-lock which it was a point of honour to leave unshorn that the conqueror might cut it off as a trophy (Catlin, "North American Indians," II, p. 24). The Tahitians believed that at death the soul was drawn out of the head by a god (Ellis, "Polynesian Researches," I, p. 396—the part of the head is not specified). Amongst the Kalmucks an incision is sometimes made in the skin to enable the soul to escape (Bastian, "Mensch," II, p. 342, *cf.* 343). In Macassar for a similar purpose the priest rubs the middle finger of the dying man, because the soul has its seat there (*ib.*, p. 322). The Hindu belief (as set forth in the Garuḍa-purāṇa) is that the soul of a bad man goes downwards and emerges like the excreta, but that the soul of a good man issues through a suture at the top of the skull. Hence the skull of the corpse is cracked with a coco-nut or a piece of sacred wood to let out the soul. Professor Monier Williams heard of a sorcerer at Lahore who made it his business to collect skulls which had not been properly cracked and so retained the souls of the deceased inside (Monier Williams, "Religious Thought and Life in India," pp. 291, 297, 299; Bastian, "Die Seele," p. 30). The Nasairiens believe that when a man is hanged his soul cannot pass out through the mouth; hence they will give the Turks large sums for the privilege of being impaled instead of hung (Bastian, "Mensch," II, p. 322). On the belly of an old Esquimaux, Ross remarked an incision which had been clearly made after death, but the reason

flings water over his face so long as there is breath left in his body.¹ The same practice of throwing water over or washing the sick, is observed also in China, Siam, Siberia, Hungary, Ruthenia, Carniola, and amongst the Koossas of South Africa.²

By analogy, the origin of the Kaffir custom of kindling a fire beside a sick person,³ the Russian practice of fumigating him,⁴ and the Persian practice of lighting a fire on the roof of a house where any one is ill,⁵ may perhaps be found in the intention of interposing a barrier of fire to prevent the escape of the soul. For with regard to the custom of lighting a fire on the roof, it is a common belief that spirits pass out and in through a hole in the roof.⁶ In the same way I would explain the extraordinary custom in Lao and Siam of surrounding a mother after childbirth with a blazing fire, within or beside which she has regularly to stay for weeks after the birth of the child.⁷ The

of which he could not ascertain (Klemm, "Culturgeschichte," II, p. 225); it may have been made to allow the soul to escape. For the soul is sometimes represented as lodged in the belly; so at Smyrna they say "my soul aches," meaning their belly aches, and a stomach plaster is dignified by the name of *ἀνὶψυχο* (B. Schmidt, "Das Volksleben der Neugriechen," p. 229).

¹ Dobritzhofer, "Account of the Abipones, II, p. 266. Amongst the Indians of California, if a sick man falls asleep they knock him about the head till he wakes, with the sincere intention of saving his life (Bancroft, "Native Races," I, p. 569). Kaffirs, when circumcised at the age of fourteen, are not allowed to sleep till the wound has healed (Campbell, "Travels in South Africa," p. 514). In Venice, when a woman has given birth to a child, a female attendant stays by her for some hours in order to keep her from sleeping, and to drive off a certain witch called Pagana (Gubernatis, "Storia comparata degli usi natalizi in Italia e presso gli altri popoli Indo-Europei," p. 147).

² Gray, "China," I, p. 278; Pallegoix, "Siam," I, p. 294; Bowring, "Siam," I, p. 121; Klemm, "Culturgeschichte," X, p. 254; "Folk-lore Journal," II, p. 102; Ralston, "Songs of the Russian People," p. 315; Wood, "Natural History of Man," I, p. 189; Lichtenstein, "Travels in Southern Africa," I, p. 258. In Tinea a wet shirt is put on the patient ("Folk-lore Journal," I, p. 167).

³ Lichtenstein, *loc. cit.*

⁴ Ralston, "Songs of the Russian People," p. 380.

⁵ Klemm, "Culturgeschichte," VII, p. 142.

⁶ Rochholz, "Deutscher Glaube und Brauch," I, p. 172; Wuttke, "Deutscher Aberglaube," §§ 725, 755; Bastian, "Mensch," II, pp. 319, 323; *id.*, "Die Seele," p. 15; Ralston, "Songs of the Russian People," p. 314; J. T. Bent, "The Cyclades," p. 437; Dennys, "Folk-lore of China," p. 22; Lammert, "Volksmedizin," p. 103; B. Schmidt, "Das Volksleben der Neugriechen," p. 149; "Relations des Jésuites," 1634, p. 23. On the Slave Coast the roof of the house is often taken off after a death (P. Bouche, "La Côte des Esclaves," p. 214).

⁷ Carl Bock, "Temples and Elephants," p. 259 *sq.*; Pallegoix, "Siam," I, p. 223; Bowring, "Siam," I, p. 120. In Burma a similar custom prevails, but the time is shorter, about seven days (Forbes, "British Burma," p. 66; "The Burman," by Shway Yoe, I, p. 1 *sq.*). Amongst the modern Parsis a fire should be kept up three days and nights after the birth of the child (J. Darmesteter, "Zend-Avesta," I, p. xciii). In Madagascar a fire is kept up in the room day and night frequently for a week after the birth (Ellis, "History of Madagascar," I, p. 151, *cf.* p. 149). It appears that it is only in Lao and Abyssinia that the fire actually surrounds the bed, and in Lao it is not kept up constantly, but is repeated day after day. But

object, I take it, is to hem in the fluttering soul at this critical period with an impassable girdle of fire. In Abyssinia immediately after the birth the woman is laid on a wooden bed, which is surrounded by blazing herbs, and here she is held fast by stout young fellows.¹

Conversely, among the Kaffirs a widow must stay by herself beside a blazing fire for a month after her husband's death, no doubt in order to get rid of his ghost.² If any confirmation of this interpretation of the Siamese practice were needed, it would seem to be found in the fact that, during her imprisonment within the fiery circle, the woman washes herself daily for a week with a mixture of salt and water,³ for salt, or salt and water, is a regular specific against spirits.⁴

Another of these two-edged weapons which can be used

putting the intermittent circular fire of Lao beside the continual side fire of Siam and Burma, and taking into account the Malagasy, Abyssinian, Scotch, and Albanian practices (see below), we are perhaps justified in inferring that the original form of the custom was a continual and continuous circle of fire. A survival of this custom is seen in the old Scotch practices of whirling a fir-candle three times round the bed on which the mother and child lay (C. Rogers, "Social Life in Scotland," I, p. 135), and of carrying fire morning and night round the mother till she was churched, and the child till it was christened (Martin's "Description of the Western Islands of Scotland," in Pinkerton's "Voyages and Travels," III, p. 612). In Sonnenberg a light must be kept constantly burning after the birth, or the witches will carry off the child (A. Schleicher, "Volksthümliches aus Sonnenberg," p. 144). Amongst the Albanians a fire is kept constantly burning in the room for forty days after the birth; the mother is not allowed to leave the house all this time, and at night she may not leave the room; and any one during this time who enters the house by night is obliged to leap over a burning brand (Hahn, "Albanesische Studien," I, p. 149). In the Cyclades no one is allowed to enter the house after sunset for many days after birth (Bent, "The Cyclades," p. 181), and in modern Greece generally the woman may not enter the church for forty days after the birth (Wachsmuth, "Das alte Griechenland im neuen," p. 73 sq.; Bent, *op. cit.*, p. 180), just as in ancient Greece she might not enter a temple during the same period (Censorinus, "De die natali," xi, 7). For similar restrictions in many parts of the world, see Gubernatis, "Usi natalizi," c. 14, and especially Ploss, "Das Kind in Brauch und Sitte der Völker," I, p. 49 sqq.; *id.*, "Das Weib in der Natur-und-Völkerkunde," II, p. 434 sqq.

¹ Ploss, "Das Weib," II, p. 434.

² Lichtenstein, "Travels in Southern Africa," I, p. 259. This too is probably the object of the dreadful ordeal through which widows among the Minas on the Slave Coast have to pass. After being shut up for six months in the room where their husband is buried, they receive a severe beating and undergo an agonising fumigation, after which they bathe in the sea (P. Bouche, "La Côte des Esclaves," p. 218 sq.).

³ Bock, *op. cit.*, p. 260.

⁴ Amongst the Moors of Morocco when a person goes from one room to another in the dark he carries salt in his hand as a protection against ghosts (A. Leared, "Morocco and the Moors," p. 275). For other "spiritual" uses of salt, see W. G. Black, "Folk-Medicine," p. 131; Henderson, "Folk-lore of the Northern Counties," p. 53; Brand, "Popular Antiquities," II, p. 234 sq.; Wuttke, "Deutscher Aberglaube," §§ 118, 733; Rochholz, "Deutscher Glaube und Brauch," I, p. 186; Strackerjan, "Aberglaube und Sagen aus dem Herzogthum Oldenburg," § 232; Theophrastus, xxiv, 95 sq. Salt is said to be particularly distasteful to the Devil (Moresini and Reginald Scott, quoted by Brand, *loc. cit.*).

either to save the soul of the dying or to repel the ghost of the dead is fine clothes. We saw that the corpse is dressed in his best clothes in order to save the ghost the trouble of coming to fetch them. Conversely when a Mongol is sick and like to die, all his finery is spread round about him in the hope of tempting the truant soul back to its deserted tabernacle, while a priest in full canonicals reads aloud a list of the pains and penalties of hell and of the risks run by souls which wilfully absent themselves from their bodies.¹ Thus, placed on the dying, fine clothes are a bait to lure the soul back; placed on the dead, they are a bribe to it to stay away. The same custom of dressing a dying person in fine clothes is observed by the Chinese, the Todas of Southern India, and the Greenlanders.²

Of course it is possible that the fiery barriers described above may also be intended to keep off evil spirits, and this is the second supplementary use to which the proceedings for barring ghosts may be turned. This would appear to have been the object with which, in Siberia, women after childbirth leaped several times over a fire,³ exactly as we saw that in Siberia mourners returning from a funeral leap over a fire for the express purpose of shaking off the spirit of the dead.

In China, the streets along which a funeral is to pass are previously sprinkled with holy water, and even the houses and warehouses along the street come in for their share, in case some artful demon might be lurking in a shop, ready to pounce out on the dead man as he passed.⁴ Special precautions are also taken by the Chinese during the actual passage of the funeral; in addition to the usual banging of gongs and popping of crackers, an attempt is made to work on the cupidity of the demons. With this view, bank-notes are scattered, regardless of expense, all along the road to the grave. The notes, I need hardly observe, are bad, but they serve the purpose, and while the ingenuous demons are engaged in the pursuit of these deceitful riches, the soul of the dead man, profiting by their distraction, pursues his way tranquilly behind the coffin to the grave.⁵

¹ Bastian, "Die Seele," p. 36.

² Gray, "China," I, p. 278; Marshall, "Travels among the Todas," p. 171; Crantz, "Greenland," I, p. 237.

³ Meiners, "Geschichte der Religionen," II, p. 107. Women before and after childbirth are thought to be especially exposed to the influence of malignant spirits.

⁴ Gray, "China," I, p. 209. The custom of closing the houses and shops before which a funeral passes (such as prevails in modern Greece, Wachsmuth, "Das alte Griechenland im neuen," p. 120) may have originally been meant to exclude the ghost.

⁵ Hue, "L'Empire Chinois," II, p. 249 *sq.*; Gray, *loc. cit.*; Doolittle, "Social Life of the Chinese," p. 153 (ed. Paxton Hood). There is a popular impression

A similar custom is observed in Corea.¹

In Annam it is the restless spirits of the unburied dead (Co-hon) who lie in wait for funerals. To appease them sham gold and silver leaf are strewn about the road to the grave, and occasionally sheets of paper are burned containing pictures of everything that the most exacting ghost could desire, coats, boots, &c., together with prayers to the saints that they would be pleased in mercy to take away these weary wanderers of earth to the eternal peace of heaven.²

In the Hervey Islands, in the South Pacific, after a death the ghosts or demons are fought and soundly pummelled by bodies of armed men, just as the Samogitians and old Prussians used to repel the ghostly squadrons by sword-cuts in the air.³ New weapons, again, may be turned to old purposes, as when a Kakhyen is borne to his last resting-place amid a rolling fire of musketry.⁴

In Christian times bells have been used to repel evil spirits; this, of course, was the intention of the passing bell.⁵ In

that the ghost is always in the coffin. This, however, is an error. Huron ghosts, broadly speaking, walk in front of the coffin (*"Relations der Jésuites,"* 1636, p. 104), Chinese ghosts (as we have just seen) walk behind it, while some Prussian ghosts exhibit a marked preference for riding on the top of it (Töppen, *"Aberglauben aus Masuren,"* p. 108; on the next page we read of the ghost following the corpse). The Coreans place a chair beside the corpse for the ghost to sit on (J. Ross, *"History of Corea,"* p. 326). In Wallendorf, when the father of the family dies and the corpse is being carried out of the house, they place a chair and a towel for the convenience of the ghost (Töppen, *op. cit.*, p. 111). Some Negro ghosts in North Guinea are undoubtedly in the coffin, for they struggle in it as they are being carried to the grave, and the bearers have the greatest difficulty in running them in (J. L. Wilson, *"Western Africa,"* c. 17). Can this be the origin of the custom which the Burmese have of dancing with the coffin on their shoulders every now and then on the way to the grave? (Forbes, *"British Burma,"* p. 95 sq.; *"The Burman,"* by Shway Yoe, II, p. 342).

¹ Ross, *"History of Corea,"* p. 319.

² J. G. Scott, *"France and Tongking,"* pp. 99, 101 sqq. If the "prowling devils" for whose special benefit the funeral is preceded by men with sticks are identical with the Co-hon, it would appear that the Annamese have not a robust faith in the unassisted efficacy of prayer.

³ Gill, *"Myths and Songs from the South Pacific,"* p. 269; Bastian, *"Mensch,"* II, p. 341.

⁴ J. Anderson, *"Mandalay to Momien,"* p. 143. In Tonquin a great army used annually to muster and open a terrific fire of artillery and small arms on the ghosts (Baron's *"Description of the Kingdom of Tonqueen,"* in Pinkerton's *"Voyages and Travels,"* ix, p. 696).

⁵ Brand, *"Popular Antiquities,"* II, p. 202; Forbes Leslie, *"Early Races of Scotland,"* II, p. 503. In Neusohl (North Hungary) the use of the bell is somewhat peculiar. When a sick man is near his end, they ring a little bell at his head, that the parting soul may linger a little to listen to the chime. When the man is dead, they still ring the bell, but go further and further off, then out of the door, and round about the house, still ringing the bell. A message is then sent that the church bell may begin to toll. (Th. Vernaleeken, *"Mythen und Sagen des Volkes in Oesterreich,"* p. 311.) There is or was a similar custom in

Scotland funerals used to be preceded by a man ringing a bell.¹ The idea that the sound of brass or iron has power to put spirits to flight prevailed also in classical antiquity, from which it may have been inherited by mediæval Christianity.² We may perhaps see the germ of the passing bell in the kettle which the Spartan women beat up and down the streets on the death of a king.³ The Moquis of Arizona exorcise evil spirits by the ringing of bells;⁴ and at Port Moresby, in New Guinea, when the church bell was first used, the natives returned thanks to the missionaries for having driven away the ghosts.⁵

I have still one observation to make on the means employed to bar ghosts, and it is this. The very same proceedings which were resorted to *after* the burial for the purpose of barring the ghost were *avoided* so long as the corpse was in the house, from fear, no doubt, of hurting and offending the ghost. Thus we saw that an axe laid on the threshold or a knife hung over the door have power, after the coffin has been carried out, to exclude the ghost, who could not enter without cutting himself. Conversely, so long as the corpse is still in the house, the use of sharp-edged instruments should be avoided in case they might wound the ghost. Thus for seven days after a death, the corpse being still in the house, the Chinese refrain from the use of knives and needles, and even of chopsticks, eating their food with their fingers.⁶ So at the memorial feasts to which they invited the dead, the Russians ate without using knives.⁷ In Germany and Bohemia a knife should not be left edge upward, lest it hurt the ghosts or the angels.⁸ They even say that if you see a knife on its back and a child in the fire, you should run to the knife before the child.⁹ Again, we saw that the Romans and Germans swept the ghost, without more ado, out of his own house. On the other hand, the negroes on the Congo considerably abstain

Bohemia (Rochholz, "Deutscher Glaube und Brauch," I, p. 179). The object appears to be to drive or lead the ghost out of the house, just as at the *Lemuria* a Roman householder ejected the ghosts by the tinkling of brass (Ovid, "Fasti," V, 441 *sqq.*).

¹ Rogers, "Social Life in Scotland," I, p. 163; E. J. Guthrie, "Old Scottish Customs," p. 140.

² Lucian, "Philopseudes," 15; Ovid, *loc. cit.* Cf. Fritzsche on Theocritus, ii, 36; Prof. Robertson Smith in the "Journal of Philology," vol. xiii, No. 26, p. 283, *note*.

³ Herodotus, vi, 58.

⁴ J. G. Bourke, "The Snake Dance of the Moquis of Arizona," p. 258.

⁵ Chalmers and Gill, "Work and Adventure in New Guinea," p. 260.

⁶ Gray, "China," I, p. 288.

⁷ Ralston, "Songs of the Russian People," p. 321.

⁸ Grimm, "Deutsche Mythologie," III, pp. 441, 454; Tettan and Temme, "Volksagen Ostpreussens Litthauens und Westpreussens," p. 285; Grohmann, "Aberglauben," &c., p. 198.

⁹ Grimm, *op. cit.*, p. 469.

for a whole year from sweeping the house where a man has died, lest the dust should annoy the ghost.¹ On the day of the funeral the Albanians refrain from sweeping the place where the corpse lay, though by a curious contradiction some one regularly sits down three times on the spot.² Again, we have seen the repugnance of ghosts to water. Hence when a death took place the Jews used to empty all the water in the house into the street, lest the ghost should fall in and be drowned.³ Similarly in some parts of Calabria (Castrovillari and Nocera) and Germany all the water vessels are emptied at death.⁴ In Burma, when the coffin is being carried out, every vessel in the house that contains water is emptied.⁵ In some parts of Bohemia, after a death, the water-butt is emptied, because if the ghost happened to bathe in it, and any one drank of it afterwards, he would be a dead man within the year.⁶ We can now appreciate the significance of the fact mentioned above, that in Greece the lustral water before the door of a house where a dead body lay had always to be fetched from a neighbouring house.⁷ For if the water had been taken from the house of death, who could tell but that the ghost might be disporting himself in it?⁸ Hence among the Jews all open vessels in the chamber of death were "unclean."⁹ In Pomerania, even *after* a burial, no washing is done in the house for some time lest the dead man should be

¹ Bastian, "Mensch," II, p. 323.

² Hahn, "Albanesische Studien," I, p. 152.

³ Buxtorf, "Synagoga Judaica," pp. 699, 712 (ed. 1712); Bodenschatz, "Kirchliche Verfassung der heutigen Juden," iv, p. 178; J. Allen, "Modern Judaism," p. 435 (ed. 1830); Gardner, "Faiths of the World," I, p. 676. The reason assigned for this custom by the most learned Talmudists is that the water is unclean because the Angel of Death has washed his dripping sword in it. Contrast the vivid spiritualism of this explanation with the vapid rationalism of the view that the emptying of the water is a means of announcing the death. Truly it is vain to bottle the new wine of reason in old customs.

⁴ Vincenzo Dorsa, "La tradizione Greco-latina negli usi e nelle credenze popolari della Calabria citeriore," p. 93; Rochholz, "Deutscher Glaube und Brauch," I, p. 176. On the other hand at San Pietro in Calabria, when a man is dying, all the vessels in the house are filled with water, for the benefit of the thirsty souls of deceased relations who are supposed to gather in the house in order to accompany the spirit of the dying man to the other world (Dorsa, *op. cit.*, p. 92 *sqq.*).

⁵ Forbes, "British Burma," p. 95.

⁶ Grohmann, "Aberglauben," &c., p. 193.

⁷ In modern Greece a vessel with water stands beside the corpse, and all who approach it sprinkle themselves, but the refinements of bringing the water from another house and placing it outside the door appear to be forgotten (Wachsmuth, "Das alte Griechenland im neuen," p. 109).

⁸ In a similar way we may explain the rule in East Prussia, Schleswig, Lausitz, and Voigtland, that while the corpse is in the house nothing should be lent or given out of it (Wuttke, "Deutscher Aberglaube," § 730; Köhler, "Volksbrauch, Aberglauben, Sagen, &c., im Voigtland," p. 441).

⁹ Numbers xix, 15.

wet in his grave.¹ Amongst the old Iranians no moisture was allowed to rest on the bread offered to the dead, for of course if the bread was damp the ghost could not get at it.²

Once more, we saw that fire was a great stumbling-block to ghosts. Hence in Calabria and Burma the fires in the house are extinguished when a death takes place, doubtless (originally) in case they should burn the ghost.³ The same custom used to be observed in the Highlands of Scotland, in Germany, and apparently in Rome.⁴ So in old Iran, no fire was allowed to be used in the house for nine days (in summer for a month) after a death,⁵ and in later times every fire in the Persian empire was extinguished in the interval between the death and burial of a king.⁶

¹ Wuttke, "Deutscher Aberglaube," § 737.

² Spiegel, "Eränische Alterthumskunde," III, p. 705.

³ Vincenzo Dorsa, "La tradizione Greco-latina negli usi e nelle credenze popolari della Calabria citeriore," pp. 20, 88; Forbes, "British Burma," p. 94.

⁴ Brand, "Popular Antiquities," II, p. 235; James Logan, "The Scottish Gael," II, p. 387; Preller, "Römische Mythologie," II, p. 159; Apuleius, "Metam." ii, 24; Juvenal, iii, 214, "tunc odimus ignem." In North Germany there is no baking in the house on the day of a death (Kuhn und Schwartz, "Norddeutsche Sagen, Märchen, und Gebräuche," p. 435). The reason of the custom appears to be forgotten in Oldenburg, where the fire is only extinguished when the corpse is carried out (Strackerjan, "Aberglaube und Sagen aus dem Herzogthum Oldenburg," I, p. 154; Wuttke, § 609).

⁵ Venóldád, V, 39 *egg.*; Spiegel, "Eränische Alterthumskunde," III, p. 706; W. Geiger, "Ostiranische Kultur im Alterthum," p. 258.

⁶ Diodorus, xvii, 114. On the other hand it has been a common practice to place a light beside the corpse for the convenience of the ghost. But it would appear that people have been somewhat puzzled how to light and warm the ghost without burning him. Thus some modern Jews place a burning candle beside the corpse in order to light the soul; but others maintain that a lighted candle near the body causes acute pain to the disembodied spirit (Gardner, "Faiths of the World," p. 677; Buxtorf, "Synagoga Judaica," p. 699; Bodenschatz, "Kirchliche Verfassung der heutigen Juden," iv, p. 171). In Germany, so long as the body is above ground a light must be kept constantly burning beside it, for which the reason assigned in Voigtland is that the soul may not walk in darkness (Wuttke, "Deutscher Aberglaube," § 729; Köhler, "Volksbrauch im Voigtlande," p. 442; A. Birlinger, "Volksthümliches aus Schwaben," p. 404; F. Schmidt, "Sitten und Gebräuche in Thüringen," p. 87). In England candles used to be burned, beside or on the corpse (Brand, "Popular Antiquities," II, p. 234; Henderson, "Folk-lore of the Northern Counties," p. 54). In Russia a lighted candle is usually placed beside the corpse or in its hand (Ralston, "Songs of the Russian People," p. 314). In modern Greece when a death takes place candles or lamps are immediately lighted and kept burning three days and three nights, for during that time the soul of the deceased is supposed to linger in or to return to the house ("Folk-lore Journal," II, p. 168; Bent, "The Cyclades," p. 221. Cf. Wachsmuth, "Das alte Griechenland im neuen," pp. 107, 108, 119). In China candles are kept burning round the coffin "to light the spirit of the dead on his way," or "to give light to the spirit which remains with the corpse" (Doolittle, "Social Life of the Chinese," p. 126; Dennys, "Folk-lore of China," p. 21; Gray, "China," I, p. 285). In Corea, when an offering is made by night to the corpse lying in the house, a candle is lit that the ghost may see what he is getting (J. Ross, "History of Corea," p. 324. On page 319 it is

This leads me to speak of the custom of fasting after a death. The Jews may eat no flesh and drink no wine so long as the corpse is in the house; they may not eat at all in the same room with the corpse, but if there is only one room in the house they may eat in it if they interpose a screen, so that in eating they do not see the corpse.¹ The Kaffirs are bound to fast from the time of

said that candles are kept burning beside the corpse day and night). Again we hear of fires being lit (generally on the grave) either to warm the ghost or to light him on his way to the spirit world. Thus in the island of Ruk and in some parts of Australia a fire is kept burning on the grave for some time "that the soul may warm himself" (Waitz, "Anthropologie," VI, pp. 686, 807. Cf. Tylor, "Primitive Culture," I, p. 484 note). In Western Africa the Krumen keep up a fire before the house of the deceased "that his spirit may warm itself" (Wood, "Natural History of Man," I, p. 616). In Ashiraland a fire is kept up in the cemetery beside the corpse of a chief for weeks (Du Chaillu, "Journey to Ashango-land," p. 133). The Winnebagoes, Algonkins, and Mexicans kept up a fire on the grave for four nights in order to light the spirit to the other world (Schoolcraft, "Indian Tribes," IV, p. 55; Brinton, "Myths of the New World," p. 257; Longfellow, "Hiawatha," xx). The Mintira kindle a fire on the grave that the ghost may not be cold (Bastian, "Die Seele," p. 110). Those of the Indians near the mouth of the Russian River who bury their dead keep up fires on the grave and make great noises, in order to keep off the evil spirit who lies in wait for the soul (Bancroft, "Native Races," III, p. 523). Some Californian Indians keep a fire burning near the grave for several nights, for which one reason assigned is that it scares away the devil, and another is that it helps to light the ghost in its precarious passage across a greasy pole to heaven (Bancroft, I, p. 357). The maid-servants maintained a fire on the grave of Hruba for three days (K. Schwenk, "Slawische Mythologie," p. 325). The Caribs made a great fire round the grave and sat there addressing speeches to the dead (Rocheport, "Histoire naturelle et morale des Isles Antilles," Rotterdam 1665, p. 567). The Indians of Guiana make a fire on the grave and celebrate a feast there (Im Thurn, "Among the Indians of Guiana," p. 225). The Andaman Islanders make a fire on the grave and leave beside it a shell with water and some article that belonged to the deceased (E. H. Man, "The Aboriginal Inhabitants of the Andaman Islands," p. 76). On Pitt Island, Kingsmill group, in the Pacific, a fire was kept continually burning in the house during all the time (four months to two years) that the corpse was in it (Waitz, "Anthropologie," V, ii, p. 155; Wood, "Natural History of Man," II, p. 382). In Vate or Efat (one of the New Hebrides) a fire was kindled on the grave to enable the soul to rise to the sun; if this was not done, the soul went to the dreary lower regions of Pakasia (Turner, "Samoa," p. 335). In Samoa a number of fires were kept up on the grave of a great chief during the night for ten days after the funeral; in the house where he lay or out in front of it fires were kept up all night. "The common people had a similar custom. After burial they kept a fire blazing in the house all night, and had the space between the house and the grave so cleared that a stream of light went forth all night from the fire to the grave" (Turner, *ib.*, p. 149). The last-mentioned custom may have been meant to show the ghost the way either to or from the grave. To this I shall have to recur shortly. The Aztecs burned the clothing, weapons, and some of the furniture of the deceased, in order that the heat of the fire might protect him against the bitter cutting wind that met him on his way to the land of souls (Klemm, "Culturgeschichte," V, p. 50).

¹ Bodenschatz, "Kirchliche Verfassung der heutigen Juden," iv, p. 177. The Jewish rule is to bury a man the day he dies (*ib.*, p. 172; Buxtorf, "Synagoga Judaica," p. 703). From Buxtorf (*op. cit.*, p. 706) it appears that the prohibition to eat flesh and drink wine extends for seven days after the death.

the death till after the burial,¹ and the same rule is or was observed by certain tribes of North American Indians.² The negroes of the Gold Coast fast long and severely after a death.³ There is a German belief that if any one eats bread while a corpse is in the house his teeth will fall out.⁴ In modern Persia a fast of eight days is observed after a death.⁵ In India a son is allowed only one meal a day during the mourning for his father; a Brahman must continue this fasting for ten days.⁶ According to another authority, a Hindoo family is not allowed to eat so long as a corpse is in the house.⁷ In Corea during the first day of mourning no food is eaten by the family mourners; sons and grandsons of the deceased eat nothing for three, less near relations for two, days.⁸ During the mourning for the Kings of Michoacan no corn was ground, no fires lighted, no business transacted; all the people remained at home and fasted.⁹ When a chief died among the Guaycurus (an Indian tribe of Paraguay), the tribe abstained from eating fish, their principal dainty.¹⁰ Amongst the Mbayas, another South American tribe, the women and slaves refrained from flesh and observed deep silence during mourning.¹¹ The Samoans commonly fasted during mourning; they ate nothing during the day, but had a meal at night.¹² So amongst the Jews the chivalrous David fasted till evening in honour of his gallant enemy Abner¹³—an ancient parallel to the minute guns which in the War of Independence the Americans fired at the close of a desperate battle, when an English General was buried on the field, just as the French guns paid funeral honours to Sir John Moore on the battlefield of Coruña.¹⁴

It might, perhaps, be supposed that this practice of fasting was a direct consequence of the extinction of fires, which, as we have seen, sometimes took place after a death, and there are facts which seem at first sight to favour this supposition. Thus the Chinese, though they are not allowed to cook in the house for

Another authority speaks of a fast from the moment of death till after the burial (J. Allen, "Modern Judaism," p. 439).

¹ Wood, "Natural History of Man," I, p. 220.

² Charlevoix, "Journal Historique," II, p. 108; Waitz, "Anthropologie," III, p. 196.

³ Waitz, "Anthropologie," II, p. 194.

⁴ Wuttke, "Deutscher Aberglaube," § 735, cf. 740.

⁵ Meiners, "Geschichte der Religionen," II, p. 702.

⁶ S. C. Bose, "The Hindoos as they are," p. 254.

⁷ Sonnerat, "Reise," I, pp. 74, 79, referred to by Knobel on Numbers xix.

⁸ J. Ross, "History of Corea," p. 322.

⁹ Bancroft, "Native Races," II, p. 622.

¹⁰ Charlevoix, "Histoire du Paraguay," I, p. 73.

¹¹ Klemm, "Culturgeschichte," II, p. 101.

¹² Turner, "Nineteen Years in Polynesia," p. 228; *id.*, "Samoa," p. 145.

¹³ 2 Samuel iii, 35.

¹⁴ Napier, "History of the Peninsular War," I, p. 500.

seven days after a death, are not prohibited from eating food which has been prepared elsewhere; indeed during this time of mourning their wants are regularly supplied by their neighbours.¹ In Florida the family was thus supplied by friends for three months.² On the evening of mourning (which is usually also the evening of the burial, the burial taking place on the day of death) a Jew may not eat his own food, but is supplied with food by his friends.³ Amongst the Albanians there is no cooking in the house for three days after a death, and the family is fed by friends.⁴ The Greeks of the Cyclades consider it wrong to cook or perform household offices in the house of mourning, so friends and relatives bring food and lay the "bitter table," as it is called.⁵ But this explanation will not suit the German superstition that while the passing bell is tolling no one within hearing should eat.⁶ For here the prohibition evidently extends to all the food in the neighbourhood. The key to the solution of this problem will perhaps be found in the Samoan usage. We are told that in Samoa, "while a dead body is in the house, no food is eaten under the same roof; the family have their meals outside or in another house. Those who attended the deceased are most careful not to handle food, and for days were fed by others as if they were helpless infants."⁷ Observe here, firstly, that the objection is not to all eating, but only to eating under the same roof with the dead; and, secondly, that those who have been

¹ Gray, "China," I, p. 287 *sqq.*

² Waitz, "Anthropologie," III, p. 196.

³ Buxtorf, "Synagoga Judaica," p. 707; Bodenschatz, "Kirchliche Verfassung der heutigen Juden," iv, p. 178.

⁴ Hahn, "Albanesische Studien," I, p. 151. Hahn forgot to inquire whether the fires in the house are extinguished, but he inclines to think that they are (*ib.*, p. 199).

⁵ T. H. Bent, "The Cyclades," pp. 197, 221.

⁶ Sonntag, "Todtenbestattung," p. 176. In its present form the superstition applies to the bell which rings for the funeral, but it seems hardly rash to assume that it originally applied to the passing bell. The same belief exists in New England ("Folk-lore Journal," II, p. 24). The reason assigned for the rule in Germany is that if you eat, your teeth will be hollow, in New England that you will have toothache. See next note.

⁷ Turner, *supra cit.* The punishment inflicted by the household god for a violation of this rule was supposed to be baldness and the loss of teeth—a curious coincidence with the reason assigned for the corresponding German and New England rule. The prohibition laid on those who had been in contact with the dead to touch food with their hands was a regular taboo in Polynesia and New Zealand. See Ellis, "Polynesian Researches," I, p. 403; Mariner, "Tonga Islands," I, p. 142 *note*; Polack, "Manners and Customs of the New Zealanders," I, p. 66 *sqq.*; Taylor, "New Zealand," p. 163; "Old New Zealand," by a Pakeha Maori, p. 124 *sqq.* (p. 105 *sqq.*, ed. 1884); Yate, "New Zealand," p. 85. The same rule seems to have prevailed amongst the Aleutian Islanders and the Jews, except that amongst the former it applied only to widows (Waitz, "Anthropologie," III, p. 316; Bastian, "Mensch," III, p. 81; Jeremiah xvi, 7, "Neither shall men break bread for them in mourning," which is the reading of the Revised Version, but the marginal reading of the Authorised).

in contact with the dead may eat, but may not touch their food. Now considering that the ghost could be cut, burned, drowned, bruised with stones, and squeezed in a door (for it is a rule in Germany not to slam a door on Saturday for fear of jamming a ghost)¹ it seems not unreasonable to suppose that a ghost could be eaten, and if we make this supposition I venture to think we have a clue to the origin of fasting after a death. People, in fact, originally refrained from eating just in those circumstances in which they considered that they might possibly in eating have devoured a ghost. This supposition explains why, so long as the corpse is in the house, the mourners may eat outside of the house, but not in it. Again, it explains why those who have been in contact with the dead and have not yet purified themselves (*i.e.*, have not yet placed a barrier between themselves and the ghost) are not allowed to touch the food they eat; obviously the ghost might be clinging to them and might be transferred from their person to the food, and so eaten.²

¹ Wuttke, "Deutscher Aberglaube," § 752.

² The probability of this explanation is at first sight somewhat diminished when we find that the prohibition to partake of food indoors was not confined to cases where there was a corpse in the house, but applied to all persons who, from whatever cause, were under a taboo. Hence a chief, who was always taboo ("Old New Zealand," p. 94), never under any circumstances ate in his house (Shortland, "Maori Religion and Mythology," p. 28; Taylor, "New Zealand," pp. 165, 168; Yate, "New Zealand," p. 87). A discussion of the ideas at the root of the taboo system would lead me too far, but I may indicate a line of argument by which the presumption raised by the fact just stated against the theory in the text may perhaps be rebutted, if not a contrary presumption raised in its favour. The infringement of a taboo was supposed to bring sickness and death on the guilty person ("Old New Zealand," p. 95 *sqq.*; Shortland, *op. cit.*, p. 31; Mariner, "Tonga Islands," I, pp. 142 *note*, 194; Klemm, "Culturgeschichte," III, p. 373). But sickness, according to the Maoris, was produced by an *atua* slipping down the throat of a man and devouring his vitals, and the aim of the medicine-man was therefore to expel the *atua* (Taylor, "New Zealand," p. 135, *cf.* pp. 137, 170; Polack, "Manners and Customs of the New Zealanders," I, p. 263 *sq.*, *cf.* p. 234; Shortland, *loc. cit.*). Now the *atus* were ancestral spirits of chiefs (Polack, I, p. 51; *cf.* Taylor, p. 135 *sqq.*), and would, when they visited the earth, naturally stay in the chief's house, who was himself an *atua* (Taylor, p. 352); hence any one who ate in the chief's house would run the risk of swallowing an *atua*, and thereby of falling sick and dying, which was exactly the effect supposed to be produced by the violation of a taboo. Consistency, however, is as little characteristic of savage as of civilised man; hence we need not be surprised to find that with this theory of sickness a Maori warrior would nevertheless gouge out and swallow the eyes of a chief whom he had slain, hoping thus to appropriate his *atua*, which resided in the eyes (Taylor, *loc. cit.*). When a Natchez had killed his first foe or made his first prisoner, he ate no flesh for six months, lest the ghost of his slain enemy should kill him (Meiners, "Geschichte der Religionen," II, p. 150 *sq.*). Part of the purification undergone by a Pima, after killing an Apache, was a fast of sixteen days; only after the fourth day was he allowed to drink a little pinole (Bancroft, "Native Races," I, p. 553, referred to above, p. 81). The Caribs are said to have fasted rigorously after the body had been buried (Rochefort, "Histoire Naturelle et Morale des Isles Antilles," p. 569, ed. 1665). Why they did not do so before, it is not easy to see.

This theory further explains the German superstition mentioned above, that no one within hearing should eat while the passing bell is tolling. For the passing bell is rung when a soul is issuing for the last time from its mortal tabernacle, and if any one in the neighbourhood were at this moment to eat, who knows but that his teeth might close on the passing soul? This explanation is confirmed by the companion superstition that no one should sleep while the passing bell is tolling, else will his sleep be the sleep of death.¹ Put into primitive language, this means that as the soul quits the body in sleep, if it chanced in this its temporary absence to fall in with a soul that was taking its eternal flight, it might, perhaps, be coaxed or bullied into accompanying it, and might thus convert what had been intended to be merely a ramble into a journey to that bourne from which no traveller returns.

All this time, however, Plutarch has been waiting for his answer, but, perhaps, as he has already waited two thousand years, he will not object to be kept in suspense for a very few more minutes. I have already detained you too long, and for the sake of brevity in what remains I will omit all mention of the particular usages on a comparison of which my answer is based, and will confine myself to stating in the briefest way their general result.

We have seen the various devices which the ingenuity of early man struck out for the purpose of giving an "iron welcome to the dead." In all of them, however, it was presupposed that the body was in the hands of the survivors and had been by them securely buried; that was the first and most essential condition, and if it was not fulfilled no amount of secondary precautions would avail to bar the ghost.

But what happened when the body could not be found, as when the man died at sea or abroad? Here the all-important question was, What could be done to lay the wandering ghost? For wander he would, till his body was safe under the sod, and by supposition his body was not to be found. The case was a difficult one, but early man was equal to it. He buried the

¹ Sonntag, "Totdenbestattung," p. 176, who says, "sonst stirbt man bald," but I cannot doubt that the original belief was as stated in the text, for it is a common belief in Germany that when a death takes place all sleepers in the house should be immediately roused or they will never wake again (Wuttke, "Deutscher Aberglaube," § 726). This again confirms my view that the bell during the ringing of which no one must eat or sleep was originally not the funeral, but the passing bell. The very cattle in the stalls and the bees in the hives are wakened after a death or they too will die (Wuttke, *loc. cit.*; Panzer, "Beitrag zur deutschen Mythologie," II, p. 293). In Scotland it was an old custom to allow no one in a house to sleep when a sick man was near his end (C. Rogers, "Social Life in Scotland," I, p. 152.)

missing man in effigy,¹ and according to all the laws of primitive

¹ The practice of burying in effigy prevailed in ancient Greece (and apparently ancient Italy), Mexico, and Samoa, and it is still preserved in more or less perfect forms in modern Greece, Italy, Albania, India, China, and Vancouver's Island. (1) In Chariton iv, ch. 1, an effigy of a missing man is carried on a bier, and it is said that it was an ancient Greek custom to give rites of sepulture to those whose bodies were not to be found (*καὶ τοὺς ἀφανείς τάφοις κοσμεῖν*). Euripides tells us that when a man had been drowned at sea his friends at home buried him *κενοῖσιν ἐν πέπλῳ ὑφάσμασιν* (Euripides, "Helene," 1243), which seems to mean that an image of him was made up with clothes; this was laid on a bier, and taken out to sea, where, along with offerings, it was thrown overboard. But it is not easy to say whether this was really a Greek custom or only a dramatic stratagem. (2) In Rome, burial of the absent took place according to certain solemn rites (Servius on Virgil, "Æneid," vi, 366). Cf. Apuleius, "Metamorphos.," I, c. 6, "At vero domi tue iam defletus et conclamatus es; liberis tuis tutores iuridici provincialis decreto dati; uxor persolutis feralibus officiis luctu et maerore diuturno deformata," &c. (3) In ancient Mexico, when a trader died in a far country the relations at home made a puppet of candlewood, adorned it with the usual paper ornaments, mourned over it, burned it, and buried the ashes in the usual way. Similarly soldiers who fell in battle were buried in effigy. Bancroft, "Native Races," II, p. 616 sq. (4) In Samoa the relations spread out a sheet on the beach near where the man had been drowned, or on the battlefield where he had fallen; then they prayed, and the first thing that lighted on the sheet (grasshopper, butterfly, or whatever it might be) was supposed to contain the soul of the deceased and was buried with all due ceremony. Turner, "Samoa," p. 150 sq. (5) In modern Greece, when a man dies abroad, a puppet is made in his likeness, and dressed in his clothes; it is laid on the bed, and mourning is made over it. Wachsmuth, "Das alte Griechenland im neuen," p. 113. (It is not, however, said that this puppet is actually buried. Mr. T. H. Bent witnessed at Mykonos a formal lamentation for an absent dead man, but where the bier would have stood there was an empty space. T. H. Bent, "The Cyclades," p. 222 sqq.) (6) A similar custom of mourning over an effigy is observed in some parts of Calabria. Vincenzo Dorsa, "La Tradizione Greco-latina negli usi e nelle credenze popolari della Calabria Citeriore," p. 93. (7) In Albania, when a man dies abroad all the usual lamentations are made at home as if the body were present; the funeral procession goes to the church, but in place of the bier a boy walks carrying a dish on which a cracknel is placed over some boiled wheat. This dish is set in the middle of the church, and the funeral service is held over it; it is not, however, buried, but the women go and weep at the grave of the relation who died last. Hahn, "Albanesische Studien," I, p. 152. (8) The Garuda-purāṇa (the best authority on modern Hindu beliefs and ceremonies relating to the dead) directs that "if a man dies in a remote place, or is killed by robbers in a forest, and his body is not found, his son should make an effigy of the deceased with Kusi grass, and then burn it on a funeral pile" with the usual ceremonies. Monier Williams, "Religious Thought and Life in India," p. 300. (9) In China, "during the reign of the Emperor Chan-tuk, in the first century of the Christian era, it was enacted that if the bodies of soldiers who fall in battle, or those of sailors who fall in naval engagements, cannot be recovered, the spirits of such men shall be called back by prayers and incantations, and that figures shall be made either of paper or of wood for their reception, and be burned with all the ordinary rites. . . . The custom is now universally observed." Gray, "China," I, p. 295 sq. "In case the corpse is not brought home to be buried, a letter, or some of the clothing recently worn by the deceased, or his shoes, or part of his baggage, is often sent home instead. The white cock and the mourners go forth to meet the letter or relic of the departed just as they would go to meet the corpse. On meeting the letter or the relic, the spirit passes as readily into the fowl as it would pass into it were the corpse itself met, and the spirit is conducted home just as surely." Doolittle, "Social

logic an effigy is every bit as good as its original.¹ Therefore when a man is buried in effigy with all due formality, that man is dead and buried beyond a doubt, and his ghost is as harmless as it is in the nature of ghosts to be.

But it occasionally happened that this burial by proxy was premature, that in fact the man was not really dead, and if he came home in person and positively declined to consider himself as dead, the question naturally arose, was he alive or was he dead? It was a delicate question, and the solution was ingenious. The man was dead, certainly—that was past praying for. But then he might be born again; he might take a new lease of life. And so it was; he was put out to nurse, he was dressed in long clothes; in short, he went through all the stages of a second childhood.² But before he was eligible even for this pleasing experience he had to overcome the initial difficulty of getting into his own house. For the door was as ghost-proof as fire and water could make it, and *he* was a ghost. As such, he had to do as ghosts do; in fact, not to put too fine a point on it, he had to come down the chimney.³ And down the chimney he came—and this is an English answer to a Roman question.

Life of the Chinese," p. 164 (ed. Paxton Hood). (10) In Vancouver's Island, when a man was drowned and his body could not be found, the mourning took place in the usual way, and to the grave were carried two cedar boards, on "one of which was a small porpoise, over which the other board was placed, which bore the roughly traced representation of a man." G. M. Sproat, "Scenes and Studies of Savage Life," p. 263.

In Madagascar cenotaphs are erected for those whose bodies cannot be found and their ghosts are supposed to be allured thither. Ellis, "History of Madagascar," I, p. 255. In New Zealand, "when a chief was killed in battle and eaten, his spirit was supposed to enter the stones of the oven, with which his body had been cooked, which retained their heat so long as it remained in them; his friends repeated their most powerful spells to draw his spirit out of the stones, and bring it within the waki tapu [sacred grove], for it was thought otherwise it could not rest, but would wonder about inflicting injury on the living, all spirits being considered maliciously inclined towards them; so when any were slain in battle, if the body could not be obtained, the friends endeavoured to procure some of the blood, or fragments of their garments, over which they uttered a karakia [spell], and thus brought the wandering soul into the spiritual fold." Taylor, "New Zealand," p. 221.

¹ For evidence see Tylor's "Early History of Mankind," p. 116 *sqq.*

² Plutarch, "Rom. Quest.," v.

³ See the passages cited in note 6 on p. 84. In classical times, when Plutarch wrote, the man probably descended through the *compluvium* (or *impluvium*, as it was less strictly called), an opening in the roof of the *atrium* or principal apartment. (See Marquardt, "Privatleben der Römer," I, p. 231 *sqq.*) It is through this opening that Terence represents Jupiter as descending to Danaë ("Eunuchus," II, 5, 40); and if any one was carried bound into the house of the Flamen Dialis, the ropes with which he had been tied had to be drawn up through the *compluvium*, and thence let down into the street (Aulus Gellius, x, 15, 8). But the *atrium* was originally dining-room and kitchen in one (Servius on Virgil, "Æneid," i, 726); hence the *compluvium* was probably the smoke-hole or chimney of the primitive house.

APPENDIX.

NOTE I.—MOURNING COSTUMES.

It has been said above (p. 73) that mourning costume is usually the reverse of that of ordinary life. Thus we find that savages who ordinarily paint themselves sometimes refrain from doing so after a death (Charlevoix, "*Histoire du Paraguay*," I, p. 73). Again, in similar circumstances, tribes which usually go naked put on certain articles of dress. Thus in some parts of New Guinea, where the men go naked and the women wear only a short grass petticoat, women in mourning wear a net over the shoulders and breast (Chalmers and Gill, "*Work and Adventure in New Guinea*," p. 35). Elsewhere in New Guinea men also wear netted vests (*ib.*, p. 130), and in another place "when in deep mourning they envelope themselves with a very tight kind of wicker-work dress, extending from the neck to the knees in such a way that they are not able to walk well" (*ib.*, p. 149). On the other hand, when the Mpongwés in Western Africa are in mourning, a woman wears as few clothes as possible, and a man wears none at all (Wood, "*Natural History of Man*," I, p. 586), though the tribe is very fond of dress, the usual garb of a man being a shirt, a square cloth falling to the ankles, and a straw hat (Du Chaillu, "*Equatorial Africa*," p. 9; cf. J. L. Wilson, "*Western Africa*," c. 19). The Lycians in mourning dressed as women (Valerius Maximus, II, 6, 13; Plutarch, "*Consol. ad Apall.*," c. 22).

Whether or not these peculiar costumes (or absence of costume) were meant to disguise the wearers of them from the ghost of the deceased, certain it is that disguises have been assumed as a means of bilking spirits. Thus the Mosquito Indians believe that the devil (Wulasha) tries to get possession of the corpse; so after they have lulled him to sleep with sweet music "four naked men *who have disguised themselves with paint*, so as not to be recognised and punished by Wulasha, rush out from a neighbouring hut" and drag the body to the grave (Bancroft, "*Native Races*," I, p. 744, *sq.*). At the feast held on the anniversary of the death these same Indians wear cloaks fantastically painted black and white, while their faces are correspondingly streaked with red and yellow, perhaps to deceive the devil. Again in Siberia, when a Shaman accompanies a soul to the under world (see above p. 67), he often paints his face red, expressly that he may not be recognised by the devils (W. Radloff, "*Aus Siberien*," II, p. 55). In South Guinea, when a woman is sick she is dressed in a fantastic costume; her face, breast, arms, and legs are painted with streaks of white and red chalk, and her head is decorated with red feathers. Thus arrayed she struts about before the door of the hut brandishing a sword (J. L. Wilson, "*Western Africa*," c. 28). The intention is doubtless to deceive or intimidate the spirit which is causing the disease. (To deceive the demon of disease modern Jews will formally change the sick man's name. Buxtorf, "*Synagoga Judaica*," p. 696; Bodenschatz, "*Kirchliche Verfassung der heutigen Juden*," iv, p. 168; J. Allen, "*Modern Judaism*," p. 434, ed. 1830.) In Guinea, women in their pregnancy also assume a peculiar attire; they leave off ornaments, allow their hair to grow, cease to paint themselves, wear peculiar bracelets, anklets, &c., and in the last eight days their heads are thickly plastered with red clay, which they may not leave off till the child is born (Klemm, "*Culturgeschichte*," III, p. 284 *sq.*). This is probably to disguise them from the demons, who lie in wait for women at these periods. And it may be the same idea which caused the Kaffirs to paint the child after birth (*ib.*, p. 285), for new-born children are apt to be carried off by spirits. (Hence the Laosians tie strings round the wrists of the baby on the first night after its birth. C. Bock, "*Temples and Elephants*," p. 259). Australian widows near the north-west bend of the Murray shave their heads and plaster them with pipe-clay, which, when dry, forms a close-fitting skull-cap, about an inch thick (Wood, "*Natural History of Man*," II, p. 92). In Ceylon the Kattadias dance in masks, in order to heal diseases caused by demons (Bastian, "*Die Seele*," p. 102). At the funeral of a high official in Corea there is a man with a hideous

mask to frighten away the spirits (Griffis, "Corea, the Hermit Nation," p. 278). If my explanation of the ceremony of passing through the fire (above, p. 81) is correct, the custom the people had of blackening each other on these occasions and wearing the smut on their faces for long afterwards was probably intended as an additional precaution against the demons of the plague (Grimm, "Deutsche Mythologie," II, p. 504).

The customs of blackening the face or body and of cutting the hair short after a death are very widespread. But when we find these customs observed after the death, not of a friend, but of a slain enemy (Bancroft, "Native Races," I, p. 764), no one will pretend that they are intended as marks of sorrow, and the explanation that they are intended to disguise the slayer from the angry ghost of the slain may be allowed to stand till a better is suggested. These disguises are meant to serve the same purpose as the so-called purifications of slayers of men and beasts (see above, p. 81). In fact, "mourning" and "purification" run into each other; this "mourning" is not mourning, and this "purification" is not purification. Both are simply pieces of spiritual armour, defences against ghosts or demons. In regard to "mourning" costume this appears clearly in the Myoro custom; when the child of a Myoro woman dies, she smears herself with butter and ashes and runs frantically about, while the men abuse her in foul language, for the express purpose of frightening away the demons who have carried off the child (Speke, "Journal of the Discovery of the Source of the Nile," p. 542). If the curses are meant to frighten, are not the ashes meant to deceive the demon? Here the disguise is adopted as a protection, not against the spirit of the dead, but against the devils which carried it off, and it is possible that the same may be true of "mourning" costume in other cases; but considering the general vicious and dangerous nature of ghosts, it is probable that "mourning" costume was usually a protection against them, rather than against devils. For examples of blackening the body in mourning by means of ashes, soot, &c., see Carver, "Travels through the Interior Parts of North America," p. 407; Bancroft, "Native Races," I, pp. 86, 134, 173, 180, 206, 288, 370; *id.*, II, p. 618; H. H. Johnston, "The River Congo," p. 426; Chalmers and Gill, "Work and Adventure in New Guinea," pp. 36, 37, 149, 266, 286; Schoolcraft, "Indian Tribes," II, p. 68; *id.*, IV, pp. 55, 66; Cook's "First Voyage," Bk. I, c. 14; Charlevoix, "Journal Historique," II, p. 111; Du Chailu, "Journey to Ashango-land," p. 133; Turner, "Samoa," p. 308 (*id.*, "Nineteen Years in Polynesia," p. 322); Waitz, "Anthropologie," III, p. 196; *id.*, VI, p. 403; Wood, "Natural History of Man," I, p. 580; Sproat, "Scenes and Studies of Savage Life," p. 259; Smith's "Virginia," in Pinkerton's "Voyages and Travels," XIII, p. 39. The Andaman Islanders smear themselves with clay (E. H. Man, "Aboriginal Inhabitants of the Andaman Islands," pp. 73, 77, 78); the Egyptians threw mud on their heads (Herodotus, ii, 85; Diodorus, i, 72), and they sometimes do so still (Wilkinson, "Manners and Customs of the Ancient Egyptians," III, p. 442). The custom of cutting the hair short in mourning is very common all over the world; examples would be endless. I may mention, however, that the Greek and Persian custom of cutting off the manes of their horses in extreme mourning is also observed by the Comanche Indians of North America (Euripides, "Alcestis," 429; Plutarch, "Pelopidas," 33; *id.*, "Alexander," 72; *id.*, "Aristides," 14; Herodotus, ix, 24; Bancroft, "Native Races," I, 523. The Comanches cut off the tails as well as the manes. Possibly the Greeks and Persians did so too, but it is only said that they "shaved" their horses, except in Euripides, where the shaving is distinctly confined to the manes). The opposite custom of letting the hair grow long in mourning is much rarer; it has been practised by the Egyptians (Herodotus, ii, 36), Jews (Buxtorf, p. 706; Bodenschatz, iv, p. 179), Chinese (Gray, "China," I, p. 286), widows on the Slave Coast (P. Bouche, "La Côte des Esclaves," p. 218 *seq.*), and Hindu sons in mourning for a parent (S. C. Bose, "The Hindoos as they are," p. 254). The practice of wounding or mutilating the body has also been very general. The case of the Koossa widow in South Africa is instructive in various ways. She had to stay by herself in a solitary place beside a blazing fire for a month (as we saw above, p.

85); by night she came secretly to the hut where she had lived with her husband, and burned it down, after which she returned to her solitude. At the end of the month she threw away her clothes, washed her whole body, scratched her breast, arms, and thighs with sharp stones, girded her body round with rushes twisted together, and at sunset returned to the *kraal* (Lichtenstein, "Travels in Southern Africa," I, p. 259). Now when we remember the pains taken by widows in other parts of Africa to get rid of their husbands' ghosts (see above, p. 79), we can hardly doubt that the precautions taken by the Koossa widow had a similar object in view; that, in fact, by scratching her person, assuming a peculiar garb, and returning at dusk to her home, she was trying to throw the ghost off the scent. Some peoples (as the *Sacæ*), after a death, went down into pits and hid themselves for days from the light of the sun (Plutarch, "Consol. ad Apoll.," 22; *Ælian*, "Var. Hist.," xii, 38). At sunset Calabrian women cease from their wild lamentations and doff the black veils which they donned at the moment of death (V. Dorsa, "La Tradizione Greco-latina negli usi e nelle credenze popolari della Calabria Citeriore," p. 91). On my hypothesis the explanation of this interesting custom is that disguise is superfluous in the dark. At the same time it is curious to find the contrary custom (strict silence by day, loud lamentations by night) in places so widely apart as Madagascar and Yucatan (Ellis, "History of Madagascar," I, p. 233; Bancroft, "Native Races," II, p. 801). In Corea, sons in mourning for their parents wear a peaked hat, which covers the face as well as the head; the Jesuits in Corea have successfully availed themselves of this costume as a disguise (Griffis, "Corea, the Hermit Nation," p. 279; Reclus, "Nouvelle Géographie Universelle," VII, p. 675).

A few words may be added on mourning colours, though the subject does not concern us here very closely. Black dress (developed out of the habit of blackening the body with ashes, &c.) was, or is still, the usual mourning in ancient Greece (Homer, "Iliad," xxiv, 94; Artemidorus, "Oneirocrit.," ii, 3; Euripides, "Alcestis," 427; Plutarch, "Pericles," 38; Xenophon, "Hellen.," i, 7, 8; &c.), Rome (Marquardt, "Privatleben der Römer," I, p. 346), modern Greece (Wachsmuth, "Das alte Griechenland in neuen," p. 109), and among widows on the Slave Coast (P. Bouche, "La Côte des Esclaves," p. 218). The Omahas in North America painted themselves white (Waitz, "Anthropologie," III, p. 196), and white dress is (or was) mourning in Corea (Ross, "History of Corea," p. 318; cf. Dallet, "Histoire de l'Église de Corée," I, p. xxix), China (Dennys, "Folklore of China," p. 25; but for a more exact statement, see Doolittle, "Social Life of the Chinese," p. 138). Tonquin (J. G. Scott, "France and Tongking," p. 98; Baron, however, describes it as ash-coloured, "Description of the Kingdom of Tonqueen," in Pinkerton, ix, p. 698; Richard—in Pinkerton, *ib.*, p. 708—agrees with Scott), Siam (Pallegoix, "Siam," I, p. 246; C. Bock, "Temples and Elephants," I, p. 246), among the Mussas (Bock, *ib.*, p. 310), in ancient Argos (Plutarch, "Quest. Rom.," 26), among Roman women, in Imperial times at least (Plutarch, *ib.*; Herodian, iv, 2), in Voigtland (Köhler, "Volksbrauch im Voigtland," p. 257, but the custom has nearly, if not quite, died out), and in Saterland in Oldenburg (Strackerjan, "Aberglaube und Sagen aus dem Herzogthum Oldenburg," II, p. 132). In England the scarfs, hatbands, and gloves worn at the funerals of unmarried persons and infants used always to be white (Brand, "Popular Antiquities," II, p. 283), and they are so still at the funerals of young persons in Scotland. When Sophocles heard of the death of Euripides he put on gray or dark blue (*ἰσάριον φαιόν ἢ τοι πορφύρεον*, Westermann's "Biographi Græci," p. 135), and gray (with the alternative of white) was mourning among the *Taußpeiorai* (Corp. Inscript. Græc, II, n. 3562, quoted by Hermann, "Lehrbuch der griechischen Privat-alterthümer," p. 370, 3te Aufl.). Blue is the mourning colour for women in some parts of Germany (Rochholz, "Deutscher Glaube und Brauch," I, p. 198). A strip of blue is worn round the head by modern Egyptian women at a funeral, and from the monuments this appears to have been an ancient custom (Lane, "Manners and Customs of the Modern Egyptians," II, p. 257). Blue is said also to be the Syrian, Cappadocian, and Armenian colour (Brand, "Popular

Antiquities," II, p. 282), and dark blue may be used as an alternative to black by widows on the Slave Coast (Bouche, *loc. cit.*). In Guatemala a widower dyed himself yellow (Bancroft, "Native Races," II, p. 802), and it is said that Anne Boleyn wore yellow for Catherine of Aragon (Brand, II, p. 283).

NOTE II.—THE GOLDEN WELCOME.

If the spirit of the dead usually receives a grim or iron he occasionally receives a loving or golden welcome from his friends. The Koreans seek to recall the departed soul. A servant takes a garment once worn by the deceased, ascends to the top of the house, and, looking northward (whither the spirits flee), he calls aloud thrice the name of the deceased (Ross, "History of Corea," p. 321). The loud cry (*conclamatio*) raised by the Romans at death may have had the same object (Becker's "Gallus," p. 506). In Masuren on the evening of the funeral day they place a chair in the chamber of death and hang a towel on the door, for on that evening the ghost comes back from the grave, seats himself on the chair, weeps bitterly, dries his tears with the towel, and goes away for ever (Toppen, "Aberglaube aus Masuren," p. 111). The Jews keep a lamp burning for seven days at the head of the bed where the man died, because the ghost returns thither to weep (Buxtorf, "Synagoga Judaica," p. 711); beside this light were placed a glass of water and a towel (Bodenschatz, "Kirchliche Verfassung der heutigen Juden," iv, p. 178. The reason here assigned is that the Angel of Death may wash his sword in the water and wipe it with the towel, but probably the water and the towel were originally intended, like the light, for the convenience of the ghost). In some parts of Calabria they place bread and water in the room for three nights, because the ghost returns at midnight to eat and drink (V. Dorsa, "La Tradizione Greco-latina negli usi e nelle credenze popolari della Calabria Citeriore," p. 92). The Samoan custom of keeping up a stream of light between the house and the grave may have been intended (as we saw, p. 91) to show the ghost the way back to the house. With this object, apparently, some Central American tribes extend a thread from the house to the grave, carrying it in a straight line over every obstacle (Bancroft, "Native Races," I, p. 745). In some parts of Germany the funeral always goes by the high road, in order that the ghost may be able to find his way home (Sonntag, "Todtbestattung," p. 175). In the Mariana Islands when a man was dying they placed a basket beside him and begged the soul at its departure to go into the basket, and to take up its quarters there on any future visits to the house (Waitz, "Anthropologie," V, ii, p. 151). In some Russian villages from time to time all the dead are feasted in a house and are then let down through the window by a shroud into the street and go their way (Ralston, "Songs of the Russian People," p. 321, *sq.*).

DISCUSSION.

The PRESIDENT thought it a fair topic of discussion whether it was likely that any widely prevalent and long enduring custom sprang from a single root, and whether, on the other hand, its existence and persistence under very varied conditions was not some evidence of its origin in many roots, and of its being sustained by a concurrence of motives. He would instance the prevalent custom in society of avoiding the name of a recently deceased person when speaking to his or her very near relatives. For his own part he felt the disinclination very strongly, on the ground that it was too direct under the circumstances, and that a euphemism was more appropriate. Probably others felt the same, and he and they followed a savage custom for totally different reasons to that by which the savage was principally governed.

CR. E. B. TYLOR remarked that Mr. Frazer's original and ingenious treatment of the evidence must materially advance the study of animistic funeral customs. His theory of the connection of purification by water or fire with attempts to bar the return of ghosts deserved, and would doubtless receive, the careful consideration of anthropologists. Dr. Tylor adduced from Mr. Yarrow's paper on Mortuary Customs a case of water burial carried out for the purpose of preventing the return of harmful ghosts. With regard to the entrance of the person supposed dead by the roof, he called attention to the fact that such entrance is adopted in some districts as a symbolic rite, perhaps indicating descent from heaven, which might possibly be the explanation of the Roman practice. Dr. Tylor concluded by expressing his satisfaction at the excellent results of Mr. Frazer's study of classical authors, not as mere ancient texts, but as repertories of real facts full of anthropological value.

MR. F. T. HALL suggested that the idea of water as a barrier between the dead and the living might have originated with the primitive and indeed general belief that the souls of the departed are not at rest until they have passed to the other side of some great water, now referred to as "the river of death." The Chaldeans made their dead cross a mysterious sea, the Egyptian dead navigated across the infernal Nile; the Greeks and Romans had their Styx, over which the soul could not be ferried until proper funeral rites had been performed with the body, the unburied wandering on this side of these waters for twelve months before being allowed to cross. Even the waters of the firmament were considered to be interposed between earth and heaven. The general idea was that the earth, the abode of the living, was encompassed by water over which the dead souls had to pass before they reached the place of rest, and that until water was interposed between the dead and the living the soul could not be at rest and was apt to wander through the earth.

MR. BEAUFORT observed that there was at all events one modern nation where water was not supposed to restrict the movements of ghosts, namely, Japan. On the evening that the speaker entered Nagasaki the Japanese were celebrating the annual return of the dead to visit the living. All the tombs were lighted by pretty coloured lanterns, and food was placed there for the use of the spirits. On the third day hundreds of miniature vessels were sent to sea freighted with food for the spirits on their return voyage. Thus the spirits make two voyages every year.

MR. HYDE CLARKE said that in the consideration of the re-entry to the house it must be taken into account that in the Persian example, as in many others, the house would be terraced on the top with an approach from below. In most cases the houses are isolated, and as there is no exit elsewhere from the terrace it is naturally suggestive as an entry for the ghost. With regard to not mentioning the name of the dead, it must be borne in mind, there is equal superstition as to mentioning the name of the living, as of a husband. So also the sacred name of a city. The name is the spiritual essence

of the ghost and the Ka. A character for name is the round or circle, and this is perhaps the origin of the cartouche encircling names in hieroglyphics, &c. He might mention one legend as to the connection of the dead and the living in Slav countries, which he had learned from a Servian friend, in whose family an example had happened, and which he believed was included in the MSS. of the folk-lore of Servia prepared for the press by Madame Mijatovich. There is a superstition of a mysterious connection between those members of a family born in the same month, who are denoted in Slav as "Same month," and of whom of course there are many examples, as we may observe that even in a family of six the births will be severally in three or four months, and not in separate months for each. On a child dying there was great fear for the sister of the "same month," and it was considered necessary to preserve her from the danger or certainty of a similar premature death. A hobble was got in with which horses of the herd are hobbled on the plain, and the living was hobbled by the leg to the dead. An exorcist then repeated the necessary formula, and to him was handed a piece of silver money (about a shilling) which had been given or begged. The child lived, which is a testimony, and of course a confirmation, of the efficacy of the process.

Mr. FRAZER, in reply, expressed his deep gratification at the interest which Mr. Tylor had expressed in his paper. It was the writings of Mr. Tylor which had first interested him in anthropology, and the perusal of them had marked an epoch in his life. He fully agreed with an observation of the President, that it would be hazardous to assume that when in modern times a man dresses very carefully on such momentous occasions as going into battle (as General Skobeleff used to do), we had here a relic of the old feeling which prompted people to dress a dying man in his best clothes. On the other hand, he was inclined to think that in the modern reluctance to mention the name of a person recently deceased we had a relic (of course quite unconscious) of the old belief that a dead man will hear and answer to his name; there was a large substratum of savagery underlying all our civilisation. Replying to Mr. Tylor he said that he (Mr. Tylor) had laid his finger on the apparent inconsistency of the facts that ghosts could bathe in water, yet not cross it; but the author pointed out that men were exactly in the same predicament—that, in fact, in dealing with primitive ghosts we always had to regard them as being as nearly as possible the exact counterpart (only invisible) of men, and hence that though ghosts had the same difficulty which men had in crossing water, yet the difficulty was not insuperable for ghosts any more than for men. Thus Mr. Beaufort had informed them that Japanese ghosts could cross water in boats, and the author referred to the well-known story of King Gunthram, whose soul was seen to depart from him in sleep and to seek in vain to cross a stream till some one laid a sword across it, on which the soul immediately crossed over to the other side. With regard to the interesting Slavonic superstition mentioned by Mr. Hyde Clarke, that a child born in the same month with a child that had died was especially

likely to die, and that special precautions had to be taken to save it, the author suggested that we might get some light by comparing the Laosian beliefs with regard to children. The Laosians think that an infant is the child, not of its parents, but of the demons; and hence they call on the demons to carry off their child within four and twenty hours after birth or else to leave it for ever. Moreover, they give the child a hideous name by way of frightening away the demon, and they sell it for a nominal price to a friend, under the impression that the demons are too honest to carry off what has been actually bought and paid for. Now if the demons had carried off a child born in a particular month, it might be thought that this gave them a special power over another child born in the same month, and that therefore special precautions were needed to prevent its dying. One of the speakers had suggested that in Persia the supposed dead man might have returned through a door in a terraced roof. In reply, Mr. Frazer said that there was evidence to show that in the case in question the entrance was made through the *compluvium*, an opening in the *atrium* or principal apartment of the house. Now as this *atrium* was distinctly stated by the ancients to have been originally sitting-room and kitchen in one, it is not unreasonable to infer that it represented the single apartment of the primitive house, and that the aperture in the roof (afterwards known as the *compluvium*) was originally the smoke-hole or chimney.

The following paper was then read by the Director:—

The SCULPTURED DOLMENS of the MORBIHAN, BRITTANY.

By Rear-Admiral F. S. TREMLETT, F.R.G.S.

[WITH PLATES III AND IV.]

THE tumuli of Brittany having been so frequently described, it will be unnecessary to give in this paper a lengthened description of them, or of their contents. Several of the most interesting monuments have disappeared, but there still remain a considerable number which will probably be untouched, from the fact that below the thin coat of humus the granite rock is found, and that stone is so easily procurable that the farmers find it more economical to establish a quarry on their fields than to blast with powder the megaliths on their land. To this circumstance may be attributed the preservation of those that remain. There is, however, an exception to this, and that is when the Church requires building stone; the parishioners are then exhorted as a religious duty to obtain and bring to the church whatever material is required, which service is invariably cheerfully rendered and gratis. To this circumstance may be attributed the gap which

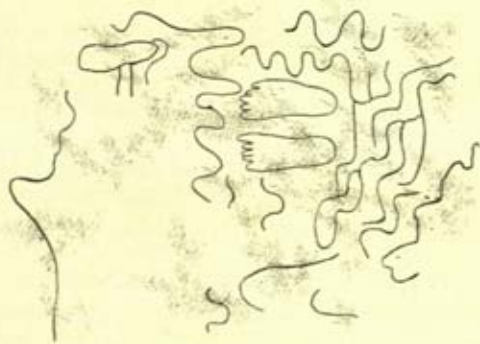


Fig. 1.



Fig. 2.

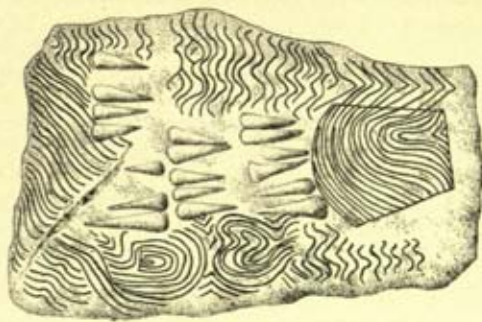


Fig. 3.

SCULPTURED STONES FROM DOLMENS IN BRITTANY.

exists between the alignments of Menac and Kermario, which evidently at one time were continuous. Indeed some of the menhirs remain concealed by the low fir trees in the fields between them. The reason why they were taken from this spot is simple. First, the menhirs were of considerable dimensions; and secondly, they were near to the high road, and therefore more easy to transport. The altars in the church are of granite, and the old beadle who accompanies visitors invariably mentions that they have been made from "menhirs." The same is said of the corona over the north porch of the church.

I propose now to offer some remarks on the sculptures of the dolmens, of which there remain about eighty. They are found usually on the capstones and their supports. A remarkable fact is that the sculptures are circumscribed to within a distance of about twelve miles, near the sea coast, beyond which, although the megaliths are so numerous, there is a complete absence of them.

The French classification of these monuments is as follows:—First, *Galgals* (cairns), composed of roughed stones heaped up, covering a stone chamber; second, *Tumuli*, having also a stone chamber, with an *allée* or passage leading to it for secondary burials. In the construction of both, a quantity of mud from the seashore, or clay, was spread over to a thickness of about 6 feet, with the object of preventing pluvial infiltration, and thus preserving the remains deposited in the chamber. I may here mention that in some cases remains of human bones were found, —almost all, however, calcined.

In some few cases these monuments still remain almost intact, but others have been denuded and have consequently become ruins. Stone being everywhere so abundant, it was really not worth while to take any from the cairns; but, on the other hand, vegetable humus being only a few inches deep, the farmers removed the earth from the tumuli and spread it over their fields. As I shall have occasionally to use the French nomenclature and classification of the sculptures of the dolmens, it seems desirable I should first explain their system, namely:

- | | |
|----------------------------|-------------------------------|
| <i>Signes Cupuliformes</i> | = Cup markings. |
| „ <i>Pediformes</i> | = Foot shape. |
| „ <i>Jugiformes</i> | = Yoke (of cattle) shape. |
| „ <i>Pectiniformes</i> | = Comb shape. |
| „ <i>Celtiformes</i> | = Celt (stone hatchet) shape. |

On referring to the Archæological Map of the Morbihan, it will be seen that a tumulus exists on the peninsula of Rhuys, named Tumiac. I propose to commence here, observing that I shall as much as possible omit the details of the explorations, confining myself principally to the sculptures.

The tumulus of Tumiac is composed of three strata. The lower one consists of rough blocks of granite heaped up; the second is of mud and clay from the seashore; the third is of vegetable humus. Its height is 65 feet, and its circumference at the base is 300 feet. From its summit there is a truly magnificent panoramic view extending from the mouth of the Loire to Belle Ile; it, in fact, commands the whole country. In order to discover its chamber a perpendicular cutting was made on its south side, from south-east to north-west, being guided by the well-known and almost universal rule that the entrance to the Breton dolmens is found between the south and east points of the compass. A remarkable difference exists as to the position of this chamber, which is that its floor is about 20 feet *above* the level of the soil, the others usually resting on the granite rock; in fact, the dolmenic chambers have been erected on it. Tumiac may be said to have two chambers joined, but without a separation. Each is nearly a square. The inner one is composed of three supports of granite, which are secured together at the corners by a species of dovetail, which is unique; it is covered by a large slab of granite. The adjoining chamber consists entirely of rough dry stone walls, having two capstones; it is rather more contracted than the former; a human parietal bone was found in the latter. Two of the supports of the first chamber are sculptured: one has on it what very much resembles a double bead necklace (Plate IV, fig. 5); below it there is what is really an indescribable figure; the other support has on its lower part parallel bars, having hooked extremities; above these are some faintly incised waved lines.

We will now proceed to Petit Mont, which is situated to the right on entering the inland sea of the Morbihan, and about three miles from Tumiac; it is stated that it was from this height that Cæsar directed the sea fight at the entrance of the Morbihan between his galleys and those of the "Veneti." A chamber was opened at the foot of this cairn in 1865. Seven of its supports are sculptured, one of which (No. 4) is remarkable, it having incised on it the outlines of two human feet (Plate III, fig. 1), this being the only instance in which any part of the human frame has been found on any of the megalithic monuments of Brittany.

Support No. 10 has incised on it what appear to be two hafted celts; on No. 8 there are some rude imitations of what seem to be axes, also hafted; the remaining sculptures are principally waved lines and cup markings, with the exception of No. 1, which has some parallel zigzags.

Although the dolmens on the peninsula of Rhuy are numerous, the preceding are the only ones which have sculp-

tures on them. We shall therefore pass over to the Ile aux Moines, which is the most considerable island in the inland sea. It has a remarkable cromlech on it, as also several dolmens: the first will be found at the village of Kergonan; it is semi-circular, its diameter is 320 feet; it has actually a farmhouse and buildings within its boundaries. It is formed of thirty-six menhirs, of from 6 to 10 feet high, and from 3 to 6 feet broad. At about a mile beyond it, and on a rising ground, will be seen the dolmen of Pen-hap; on the exterior of its left support, on entering the chamber, there is sculptured a remarkable axe, now much weather-worn; on the inner side of the same support, and inside of the chamber, will be found incised a double oval figure, terminating in cup markings.

We will now pass on to Innis-hir (Long Island), which has on its highest part a cairn containing a chamber, now almost blocked up with stones; on one of the supports of its gallery there is incised a cartouche, now much weathered and hardly discernible.

On the south side of the next island, Gavr Innis, or "Goat Island," there is an elongated cairn, which has a diameter of 180 feet; its original height was 30 feet, but it is now only about 20 feet, its top having been removed, and a sort of crater formed, which reaches down to the capstones. This was done (it is said) to admit light into the chamber. The original form of this cairn was that of an elongated cone, and from its summit a really magnificent panoramic view of the Morbihan and the adjacent islands, as also of the surrounding country, was obtained. The date of its first opening is unknown; its late proprietor opened it in 1832, but it soon became evident that he had been anticipated, the chamber and its *allée* being nearly filled up with stone and rubbish. There was formerly a monastery on this island, the ruins of which existed until lately. The monks probably opened the cairn; it is also a well-authenticated fact that it served as a hiding-place during the revolution of 1793. The dimensions of the chamber are 8 feet by 7, and 5 feet 8 inches high; its *allée* is 14 feet long, 4 feet 6 inches broad, and 5 feet 4 inches high; its side walls consist of twenty-three supporting menhirs. The chamber has eight supports and one capstone, 12 feet 6 inches by 9 feet 6 inches. The chamber and its *allée* are paved with granite flags. All the supports, with the exception of two which are of quartz, are sculptured; the intricacies of these sculptures are truly surprising. They have been compared by some to the tattooing of the New Zealanders. We meet here with sculptured celts of the Neolithic period, which are represented thirty-one times on six of the supports. Four of the latter merit a special attention: one is in the

chamber (No. 9), it has three circular hollows which communicate, there being two loops externally, and which form the divisions; there is ample room to pass the hand through at the back of these loops. Endless theories exist as to their use, but the solution has not been found. Some have imagined that victims were attached to them and there immolated. This appears hardly possible, it being admitted that the chamber was sepulchral. The support No. 8 is peculiar from the arrangement of the celts, which are so placed that in each successive line the numbers are alternately odd and even (Plate III, fig. 3). It has also a cartouche. Support No. 21 has on its lower part three waved figures, which resemble snakes; these have given rise to theories as to the existence of serpent worship, but they are not serpents at all; this has been much disputed. The support No. 16 has on it not only some elaborate sculptures, but also a species of inverted cartouche. The support No. 20 has on the top of it a capstone, having a hafted axe sculptured on it; the stepping stone into the chamber is also prettily sculptured.

We shall now land at Locmariaquer, and visit the dolmen "Des Marchands," also named "La table de César." It has an enormous capstone, which is balanced on the points of three of its supports; it has sculptured on its lower surface (within the chamber) an axe having a handle to it. Endless discussions have taken place as to the interpretation of this symbol, but without arriving at a solution. Some have maintained that it is a phallus, others that it is a plough, a hafted celt, and even an emblem of original sin. At the further end of the chamber there is a cartouche of enormous dimensions; it is in the form of an ogive, and it has on it in relief a series of characters of the pediforme class. The height of this chamber under its capstone is 7 feet. There are also two incised sculptures on the upper parts of the supports of the table, but it is difficult to make them out, as the latter rests on them. It is clear that these sculptures must have been made prior to the erection of the dolmen, as they extend on to the edges of the supports; indeed they stand so close to each other that it would have been impossible to introduce a tool between them. Exactly the same may be said of "Mein Drein," the cup markings on its lower surface resting on its supports. I may here remark that raised sculptures are very rare in the dolmens; those at Gavr Innis may appear to be so, but it is an error, the fact being that the incised lines are so near to each other that the intermediate space appears to be raised.

Our next visit will be to Māné-er-Hroëg, "Mountain of the Fairy or Girl." This is in reality an enormous cairn; its form is elliptical, its diameter is 300 feet, and its height is 30 feet; it had

been coated over with clay, above which there was found in the humus several Roman coins of the reigns of Augustus, Tiberius, Claudius, Nero, Domitian and Trajan, some bronze jewellery, and a bronze finger ring having an engraved stone setting, some bricks, tegulæ, and a square white glass bottle. I may here mention that the same has invariably been the case with the cairns of great height in the neighbouring districts; the country being flat it is believed that the Romans availed themselves of these elevations on which to erect guard-houses and signal stations. At the Moustoir near Carnac, Roman remains, pottery, glass, bricks, and tegulæ, as also a coin of Magnentius, were found. The chamber of Mâné-er-Hroëg is square; there were no sculptures in its interior. Its entrance had been closed by a dry stone wall, in which there was a very curiously incised cippus (Plate III, fig. 2); there are apparently several axes having streamers attached to the haft; there is also a cartouche—nothing resembling it has ever been found elsewhere in Brittany. There was another stone built up in the wall having cup markings on it. It is further to be noted that the capstone of this chamber rested on dry masonry walls; there was no *allée*, but it had a crypt below its floor.

The *Mâné Lud*, or "Mountain of Cinders" (which is a misnomer), was long supposed to be composed of ashes and cinders; it is a barrow 300 feet long, 150 feet broad, and 30 feet high; it is in reality composed of clay and mud from the seashore; it contains three places of sepulture; it has a small chamber in its centre, an *allée* of menhirs (transversely) within its eastern end, which were found to be capped with horses' skulls. There is a very fine dolmen at its western end. The chamber in the centre was formed by overlapping stones projecting gradually till a dome was formed which was closed by a slab; the remains of two bodies were found in it, one of which had been incinerated: they were separated by a stone partition. There were a quantity of horses' bones (also incinerated) on the exterior of the vault. The dolmen is a handsome one, having seven of its supports sculptured (Plate IV, fig. 4). The jugiforme is frequently repeated, as also the pectiniforme. Three of the celts are hafted, but one is not; the first seemed to have withies twisted round them similarly to the plan employed by blacksmiths for holding their chisels when tongs are not used. There is also a cartouche, and a series of cup markings. There is further on the flooring a raised sculpture which has given rise to endless discussions. Some have maintained that it represents the haft of a celt, others that it is intended for an unstrung bow; but in reality no solution has been or is likely to be arrived at. There is a crypt below the stone floor of this dolmen.

Bé-er-Groah ("Tomb of the Old Woman"). This dolmen is

quite near to the village; it has an inner and an outer chamber, which are contiguous. Three of its supports are sculptured. One is an axe and another is a "jugiforme." Owing to the upper part of the stone having shaled off, the third one is incomplete, and it is therefore difficult to determine what it represents. The capstone of this dolmen is remarkable, it being a slab of granite 34 feet long, 14 feet broad, and 22 inches thick. This dolmen was examined in 1860, but it was evident that it had been previously explored.

The land about Locmariaquer is still strewed with pieces of Roman bricks, notwithstanding that the French Government transported shiploads of them to l'Orient for building in the dockyard; some of the cottages at Locmariaquer have their floors paved with Roman bricks.

The *Pierres Plattes* ("Flat Stones"). This is an *allée couverte*, having an angle in it, its further end being partitioned off to form a chamber. It is situated near the seashore beyond Kerpenhir, and it is now in a ruinous state, so much so that it is difficult to get a sight of the sculptures, of which there are five. One is a cartouche in compartments, having raised circular knobs in each; it has been compared with one from Egypt which is now in the Museum of the Louvre at Paris; the remaining sculptures are also cartouches. Although there are eleven other dolmens in the vicinity none have sculptures on them, but one at Loperhet has cup markings. As we shall now leave Locmariaquer I may perhaps be permitted to explain its etymology, which has so puzzled tourists. It is really composed of three Breton words joined. "*Loc*," a holy place, hermitage, or chapel; "*Maria*," the Virgin; and "*Ker*," a village or farm, *i.e.*, "The village of the Holy Virgin Mary."

Mein Drein ("Stone of Thorns") is situated on the right hand side of the road from Locmariaquer to Crach; it is oval, and has no *allée*. It consists of thirteen supports and two capstones (*vide* No. 1); the further one has 144 cup markings on its under surface, three of its supports are sculptured; the fourth one (Plate IV, fig. 6) has some curious "pectiniformes" and pediformes sculptured on it.

Although the dolmens in the neighbourhood of Crach are very numerous none have sculptures; we shall therefore pass on to the Carnac district, where there are five dolmens having cup markings, and two having lapidary sculptures; of the former the Mont Saint Michel is the most important cairn in the Morbihan, it being 320 feet long, 80 feet high, and 120 feet broad. It is composed of rough stones heaped up, which are computed to measure 100,000 cubic feet; these have also been covered with clay to a thickness of 6 feet. It was opened by driving a perpendicular shaft, and

it was found to have a central chamber similar to the one of M^{an}é-er-Hroëg at Locmariaquer. Incinerated bones were found in the crypt below the floor of its chamber; on the under part of its capstone there were six cup markings, so placed as to resemble the constellation of the Pleiades.

About a mile distant from this cairn, and to the right of the alignments of Kermario, is situated the Chateau of Kercado, near which there is a tumulus of the same name; it will well repay a visit, as it is the only one that remains intact in its barrow, and also in a state of preservation. It will be necessary to be provided with lights to enter it. Some angular sculptures will be found on the third support of its *allée*, and another somewhat similar on the first support to the left on entering the chamber. There is a perfectly sculptured axe on the lower part of its capstone. This chamber is in a good state of preservation owing to its having been fitted with a door, the key of which is kept at the Chateau; its dimensions are as near as possible a cube of 8 feet; the length of its *allée* is 23 feet.

On the road from Plouharnel to Auray, and at about two miles from Carnac, there is a group of three dolmens named *M^{an}é Kérion*; the first one to the right has six sculptured supports (Plate IV, figs. 7, 8), which sculptures are mostly angular, and dissimilar to those before described. One of them is remarkable, it having a graduated scale on its outer edge somewhat resembling a ladder (Plate IV, fig. 8); a hafted celt, a cross, and a jugiforme will also be found on these stones. Although the dolmens in this neighbourhood are numerous (there being about fifty in the neighbourhood of Carnac and Plouharnel), there are no sculptures except some cup markings. It is difficult to account for this, unless the sculptures of the dolmens have been confined to a particular district, or perhaps tribe, whose religious cult or social system differed from the others.

It now remains for me to endeavour to elucidate two points with regard to these sculptures. First, the period when they were made, and, secondly, the implements with which they were cut.

In the before-mentioned dolmens there are found in almost every case Neolithic implements, generally highly polished; they consisted of well-finished celts, some of which were of large dimensions; the material employed being nephrite, jadeite, chloromelanite, agalmatolite, tremolite, fibrolite, and diorite. There were also some remarkable necklaces of calais (green turquoise), flint knives and chips, as also a few arrowheads. There were some urns, and generally a great quantity of shards of pottery, which had been badly fired; some of it was ornamented with a Vandyke pattern, having a dot in the angles; withies

had also been used to impress circles. Generally speaking, only fragments of human bones were found; in *three* cases they had been incinerated; the latter are presumably the more recent, but as no metal whatever was found in the chambers we may, I think, assume that the sculptures are of the Neolithic period. A peculiarity may here be mentioned, viz., that where incinerated bones were found there was an absence of sculptures, but the Mont Michel dolmen had cup markings on its capstone.

As regards the means employed for sculpturing the stones, no iron or bronze, or even the stains of these metals, having been found in the chambers, we may probably assume that *stone* was employed for the purpose. Having in my peregrinations observed a quantity of chert in the neighbourhood, as also that there was a vein or dyke of it across the granite rock at Clou Carnac, it struck me that I could possibly cut granite with it. Accordingly I selected a blunt and rather heavy piece of it, and commenced operations on a *roche moutonnée* of fine grained granite; its exterior was indurated and difficult to penetrate, but I found the inside of the stone softer, and after pounding and pulverizing for about twenty minutes I found that I had made a really deep cup. I easily made others. I may here remark that I selected this erratic block knowing that it was harder and more compact than the coarse grained granite of the country, which is softer, and of which the dolmens have been constructed. The next thing I had to do was to try and cut scores or lines on the granite; for this purpose I obtained a heavy piece of chert, having a pointed end. I worked away with it and succeeded perfectly in making them on the face of the rock. I therefore came to the conclusion (though perhaps erroneously) that the sculptures of the dolmens had been made in the same manner, and with the same material, namely, the chert which is found not only in great quantities, but of every shade of colour, from deep red to light yellow and white, in those parts of the country where the sculptured dolmens are found.

In conclusion, I may allude to a fact which has not generally been noticed, which is that the surfaces of the granite on which there are sculptures appear to have been previously smoothed or levelled by some process, the exterior being left in a perfectly rough state.

Explanation of Plates III and IV.

- Fig. 1. Sculptures on dolmen of Petit Mont, Avzon, Brittany.
The outlines of the human foot are notable.
- „ 2. Ditto on Mâné-er-Hroëg, Lockmariaquer. This stone formed part of the wall which closed the entrance of the chamber of the dolmen.

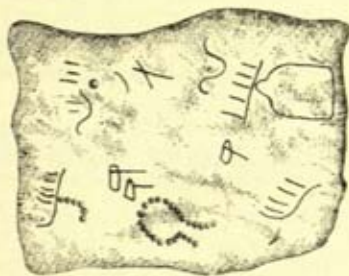


Fig. 4.

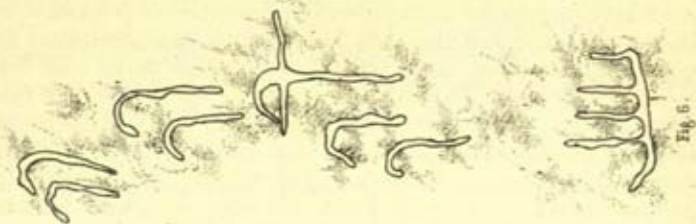


Fig. 5.



Fig. 6.

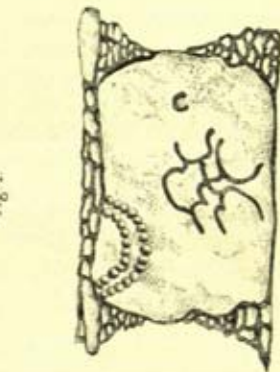


Fig. 7.

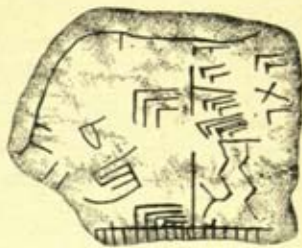


Fig. 8.

SCULPTURED STONES FROM DOLMENS IN BRITANNY.

- Fig. 3. Sculptures on Gavr-Innis, showing rows of celts.
 „ 4. Ditto on dolmen of Mané Lud, Locmariaquer.
 „ 5. Ditto on the west support at Tumiac, Arzon.
 „ 6. Ditto on dolmen of Mein Drein.
 Figs. 7 and 8. Ditto on Mané Kerion, near Plouharnel.

DISCUSSION.

Mr. F. G. H. PRICE did not agree with the author of the paper as to the antiquity of these monuments, as, had they existed before the time of the Romans, such huge monoliths would hardly have been overlooked and left unnoticed by their historians, who so fully described all the people they came in contact with, as well as their manners and customs. Roman interments, urns, fragments of Samian and other pottery, Roman coins, tiles, &c., had been met with beneath the dolmens, which proved them to have been post-Roman. These monuments were possibly erected by the Veneti in the latter part of the Roman occupation, which might in a measure account for some of the interments having been found in the earth over the dolmens. The speaker did not see why it was necessary to suppose that the sculptures were engraven by chert or quartz implements when there must have been plenty of bronze and iron at that period for the purpose. He agreed with Mr. Fergusson, in his "Rude Stone Monuments," in supposing these dolmens to date from the end of the fourth century A.D. to the sixth century A.D., when the custom of erecting such monuments was universal.

MARCH 24TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From the AUTHOR.—The Mound Builders. By George Bryce, M.A., LL.D.
 — L'Anthropologie Générale a l'Exposition de Turin en 1884. By Pompeo Castelfranco.
 — Œuvres inédites des Artistes Chasseurs de Rennes. By Émile Cartailhac.

- From the MANITOBA HISTORICAL AND SCIENTIFIC SOCIETY.—Papers read before the Society, 1884–5. Annual Report for the year 1884–5.
- From the ACADEMY.—Boletín de la Academia Nacional de Ciencias en Córdoba. Tom. VII, Entrega 3^a.
- Atti della Reale Accademia dei Lincei. Serie Quarta, Vol I, Fas 6.
- From the SOCIETY.—Bulletin des Procès-Verbaux de la Société d'Émulation d'Abbeville, avec une table analytique des Séances. 1881–1883.
- Bulletin de la Société d'Anthropologie de Lyon. 1883, Fas. 1, 2; 1884, Fas. 1.
- Proceedings of the Royal Geographical Society. March, 1885.
- Journal of the Society of Arts. No. 1687.
- From the EDITOR.—Matériaux pour l'Histoire de l'Homme. March, 1885.
- “Science,” Nos. 108, 109.
- “Nature,” Nos. 802, 803.
- Revue Scientifique. Tom. XXXV, Nos. 11, 12.
- Revue Politique. Tom. XXXV, Nos. 11, 12.

The election of the Hon. CECIL DUNCOMBE, and of F. D. MOCATTA, Esq., was announced.

The following paper was read by the author:—

On the NATIVES of NEW IRELAND. By A. J. DUFFIELD, Esq.

BEFORE proceeding with the slight sketch which I propose to make of the Islanders of New Ireland, or Tombarra, as it is called by the natives, I should like to describe in two or three words the impression which these people made upon me when I first saw them, and the conviction I retain regarding their moral and intellectual state.

The first impression I received was one of mingled shame and disgust. Here were grown-up beings, to all outward seeming men, playing the fool in broad daylight; painting their faces, making a hideous caricature of what had at least the semblance of beauty and good looks. But this impression was speedily displaced by another: closer contact drew from them, almost without exception, the most delightful, and at the same time novel delight in feeling a white man, trying to ascertain what relation his shirt had to his skin, or his white pith helmet to his skull. They gave way to unreserved admiration of what they saw, but could not understand; and just as town-bred

children run to pluck the flowers of the field or the fruit of the hedge when they get the chance, so did these children of older growth, on my first making their acquaintance, proceed to help themselves to all that pleased them, and to everything in the form of ornament, or portable chain, button, or pocket cutlery. They showed no emotion on seeing a watch, but the sight of a common screw, when they saw it enter two pieces of wood, and hold them together, produced screams of joyous appreciative laughter. They were ready to part with anything they had for a brass screw. They understood at once the use of a file, a hammer, a saw, but the mechanism of a large clasp knife puzzled them. Their wonder and astonishment on seeing a large white drinking-glass, made it obvious that the thing was quite new to them; and they were not quite sure whether it was a product of nature or of art. They evinced a marked repugnance to a painted landscape, but the coloured photograph of a fair woman rivetted their silent attention. When shown a looking-glass, some were at first scared for a few seconds, but presently broke out into hearty laughter when they saw their reflected image laugh, but making no sound. Others were struck with fear, as if they had seen a ghost and closed their eyes. When shown its reflecting power by flashing it in the face of the sun, they were much pleased, but their attention was chiefly occupied by the idea of how they could manage to get hold of some of these wonderful things and keep them. One or two of the more daring at once took possession of some of the articles they admired, but readily gave them up when required to do so. It was quite impossible for me to resist the impression that it was as easy to train these people to the useful and the good, as it is by a happy knack to blow a smouldering wick into a flame. That is the permanent feeling which I retain regarding them.

As a rule the women were much more communicative than the men, but the men were willing and docile; they soon learnt, when on board ship, how to wash decks, and this work was always done to songs of their own making; they submitted, without murmur, to occupy different parts of the ship during meal times and at night. At first, when breakfast and dinner were prepared, the women waited on the men, but in a few days afterwards, to their infinite amazement, I made the women sit down, and the men got no food until they had first carried from the galley the food intended for the other sex. For some time the women did not like it. The men grew more and more sulky over it, and it was not until I took part in waiting on the ladies myself that the new arrangement was willingly carried out. They all went regularly to bed at a fixed hour, rose with the sun,

cooked their own food, washed their own vessels, chopped fire-wood, and learnt to wash, sew, and mend clothes. The women took readily to clothing, but much preferred to make ribbons of calico petticoats to adorn their heads than to cover their bodies. They were nice and dainty in their food, and would rather die than take physic. Their keenness of sense was remarkable: any uncommon odour was repulsive to them, while carbolic acid drove them wild. Their eyesight was remarkable: they could, and frequently did, discover land which we were unable to make out with good glasses; they could pick out a small boat six or seven miles off at sea in bad weather, when we were unable to do so with binoculars or telescopes. But not only were they uncommonly good at long sight, they were equally so in making very small beads out of shells, and doing minute carving and engraving on spears and clubs, on canoes, combs, earrings, necklaces, bracelets, and on musical instruments; not to mention the fine tattooings with which many women's faces were disfigured. The Indians of the South American deserts can see great distances, and distinguish the colours of mules and horses long before any European eyes can; but they do not surpass or equal these New Irelanders in their power of sight.

But I attach more importance to the ready manner in which they took to habits of cleanliness, order, and regularity. They were easily taught many simple things, but the teaching had to be incessant, and the teacher always present to ensure a good result; when left to themselves they speedily relapsed into empty idleness. I assume then that these people are the offspring of remote but superior races, that they retain some inherited powers, which have become weak by lack of use, and that these moral and intellectual powers can be easily restored.

New Ireland is situated about 300 miles south of the Equator, and separated by a strait, 50 miles wide, from the south-east coast of New Guinea. The island is some 250 miles long, and 30 or more miles broad. Viewed from seaward it is seen to be densely wooded and well watered. Cocoa and areca nut palms stand out against the sky along the summits, and grow in immense numbers all along the shore. Vast patches of the hill-sides are under cultivation, and these are fenced with wicker-work. Yams and taro are the roots mainly cultivated. The food of the natives is chiefly vegetable, and consists of cocoa-nuts, yams, taro, arrowroot, nutmegs, haricot beans, bread fruit, the sweet potato, bananas, and other fruits. Sometimes they add fish, and now and then kill a pig; there is abundance of domestic poultry; we also found plenty of nuts, chili peppers, and the delicious mangostine. The only wild animal I found was a small opossum.

The climate is humid, the vegetation a dark green, and every tree appeared to be overrun with parasitic plants. Although food appeared to be abundant, the natives were poor in flesh, lanky, short in stature, slight in weight. Their usual colour is a dark brown, but many are much lighter. No doubt there is a considerable mixture of blood among them. The hair of the head is crisp and glossy, and as dense and populated as their own hills. Many of the black men had abundance of hair on their bodies; the lighter-coloured had little or none.

The tattooing and cuttings on the flesh were entirely confined to women and the head men. The tattooing is abundant at the corners of the eyes and mouth, and is darkened by rubbing in the powdered oxide of manganese, which they call *labám*.

The men go absolutely naked, but the women wear "aprons" of grass in front and behind, suspended from cinctures, made of beads strung on threads drawn from the leaves of the aloe. The women also make an excellent bonnet from palm leaves, and also a cloak which covers the back and head, used only in the rainy season; they evinced great fear of getting wet in the rain.

I noticed no mutilations among them, no cutting off of eyebrows, or knocking out of teeth. The septum of the nose is perforated to receive rings of beads, and other ornaments, the only breach of good taste in adorning themselves to be found among them. They stick flowers and gaudy feathers in their hair, and wear garters on their naked legs under the knee, well knitted out of fibre. Many bleach their hair with coral lime, paint their bodies with red and yellow earths, and get up their faces like the clown and pantaloon in a pantomime.

Their huts are singularly well thatched, and are raised from the ground on heavy logs about 2 feet high; there are no doors, windows, or chimneys. In pottery they make well-shaped water-bottles.

They construct admirable canoes, but use no sails. The canoes are beautifully carved—are made of well-cut battens, $\frac{1}{2}$ inch thick, 20 feet long, and 5 inches wide, and pitched with some black resinous stuff which they call *anteet*. Their paddles are symmetrical, and oftentimes carved with taste and skill. The figure-head of the canoe is admirably sculptured. Twenty paddles in a canoe can raise the speed through the water to a good ten knots an hour, and I have seen canoes keep up this pace for at least an hour and half without stopping.

Their weapons are clubs and spears. They have no bows and arrows. The clubs are of all shapes, of heavy, well-polished, dark woods, and excellently carved. The prevailing form was that of the cricket bat.

The spears are ornamented with beautiful engraving, are of great length, well pointed, and horribly barbed with birds' bones. Some of these I found clotted with putrid blood, but whether it was used as a poison, or was the blood of some victim, I do not know. A goodly number of men bore deep scars on the forehead and thighs, the result of recent fighting among themselves. Some of the women bore cruel marks of ill-treatment.

They speak a language which is at once musical and familiar, in which I found a fair sprinkling of Spanish and Arabic words and names. *Palacios, Papa, Gomes, Baul, Pasián, Fandango, Cabinay, Lakavatt Malawáh, Teh, Solyman, Tzigléh, Tzogoll, Fakowmeleh, Yelly-yelli, Liliguy, Fampow, and Festelli* were among some of the names which I took down from islanders' lips.

The following words, picked out of some four hundred which I collected, may be of interest:—

The head is	..	..	<i>pakaloon.</i>
The hair of the head	..	..	<i>olalan.</i>
Forehead	..	..	<i>tatan or tatangue.</i>
Eye-brows	..	..	<i>pilpirrimatan.</i>
The eyes	..	..	<i>malan or malangue.</i>
Eye-lashes	..	..	<i>ololonmalangue.</i>
Cheek	..	..	<i>tataan.</i>
The ear	..	..	<i>bambaloon.</i>
Nose	..	..	<i>gogorong.</i>
Mouth	..	..	<i>amboolin.</i>
The lips	..	..	<i>amboolingue.</i>
Teeth	..	..	<i>nersán.</i>
Chin	..	..	<i>comesán.</i>
Neck	..	..	<i>auconconong.</i>
Shoulder	..	..	<i>pasuán.</i>
Arm	..	..	<i>nemann.</i>
Hand	..	..	<i>pocklaneman.</i>
Fingers	..	..	<i>bidbidaneman.</i>
Woman's breast	..	..	<i>susung.</i>
Stomach	..	..	<i>ambunang.</i>
Navel	..	..	<i>ambuling.</i>
Thigh	..	..	<i>panwack.</i>
The buttocks	..	..	<i>putputunge.</i>
The back	..	..	<i>ampocktan.</i>
Leg	..	..	<i>parwangee.</i>
Calf of leg	..	..	<i>dannekeken.</i>
Knee	..	..	<i>ampiscontibee.</i>
Foot	..	..	<i>potankeken.</i>
The apron	..	..	<i>soofunfun.</i>
Virile hair	..	..	<i>ololoconmock.</i>

They count up to ten, and their numerals are—

1	<i>teká.</i>	6	<i>kabon.</i>
2	<i>oo.</i>	7	<i>kafus.</i>
3	<i>tool.</i>	8	<i>kavál.</i>
4	<i>fet.</i>	9	<i>valkasú.</i>
5	<i>kasan.</i>	10	<i>sukasanfool.</i>

The first European visitors to New Ireland, and its adjacent islands, of whom we have authentic records, were Spaniards. The first expedition, headed by Mendaña de Meyra, sailed from the coast of Peru in 1567, and for some thirteen years the Spaniards with varying success continued in these waters; the only remains of their visits being the names of many islands (such as Guadalcanal, Sesga, Solomon, St. Antonia, Santa Lucia, Espirito Santo, San José, Santa Isabel, Los Reyes, Santa Cruz, and others), a few isolated words, and a marked Spanish likeness in some of the lighter-skinned natives.

Since the Spaniards, the islands have also been visited by the English in 1767, when Captain Philip discovered the Admiralty group some 150 miles further east; by the French under Deutrecasteaux in 1791, when out in search of La Perouse; and by the Americans under Captain Morrell in 1843.

Since then, and more particularly during the past twenty years, the communications with Europeans have been numerous, with fatal results to the natives. The first attraction which the islands offered was the exuberant abundance of cocoa-nuts. It may be safely said that in New Ireland and its neighbouring islands, some twenty in number, the Germans found 200,000 cocoa-nut trees in full bearing.

The annual product of each tree is worth one dollar, and it may also be safely said that the annual cost of collecting \$200,000 to the Germans did not exceed £15. The barter for these cocoa-nuts consists of glass beads, poor cutlery, tobacco and pipes, cheap rum and other fire waters, with what consequences to the natives it is easy to imagine.

The Americans have kept themselves to whaling, the French to pearl-fishing and digging for *bêche-de-mer*, and the English of the neighbouring colonies have "recruited" the men and women for their industrial army engaged in producing sugar for the most part.

This "recruiting" has been easy on account of the peculiar power which the king or head man of an island has over the lives of the natives; he can command men and women to go wherever he pleases, and they obey without a murmur.

I suppose it may be safely inferred that the ornamenting of spears and clubs, and other missiles of war, indicates the existence

among the natives of what is known as the religion of blood revenge. One thing is certain, that their spears, arrows, and clubs are beautifully ornamented, and as elaborately as any Eastern gun or sabre. I believe it is true that the making of weapons of war in the South Sea Islands is still carried on to a large extent, and shows no more sign of ceasing than is to be found among the powerful and polite nations of the world.

I commend to the notice of all who may be interested in these people, the masks, weapons, and other things which are to be found in the British Museum, which will not fail to impress all who study them that the people who made them possess a refinement which is capable of being much extended.

DISCUSSION.

The PRESIDENT, in introducing the paper, remarked that it dealt with one of a group of islands of whose inhabitants we knew little, but in whom recent schemes of colonization had excited interest. Mr. Duffield had had considerable opportunity, in the course of his inquiries into the Australian labour traffic, of watching the behaviour of the people whom he described. His paper would be doubly of value, both on its own account and as a means of eliciting information about the inhabitants of it and of the neighbouring islands, which not a few of those present at the meeting were eminently qualified to give.

Mr. COUTTS TROTTER, having been called upon to speak after the reading of the paper, said he would have liked to elicit something as to the relation of the population of the southern part of New Ireland. Mr. Powell, he understood, said they were evidently connected with the Solomon Islanders; Mr. Weisse, of the "*Hyäne*," in a letter to Professor Bastian, said they have a markedly Polynesian character. But the features which in the Solomon Islanders were grafted on a Melanesian stock seemed to point to other than a Polynesian source: rather, one would say, to a Malay. Mr. Trotter was surprised to hear of the numbers of very fair people met with by Mr. Duffield, for other observers had reported a very marked repugnance to, as well as fear of, a white-skin—so much so that it is the custom to hold new-born infants over a smoky fire in order that they may grow up black. Mr. Trotter was much struck by Mr. Duffield's emphatic belief in the capacity of the race for improvement, which at all events testified to the humane and enlightened character of his dealings with them.

Mr. WILFRED POWELL and Mr. GUPPY also joined in the discussion.

Mr. DUFFIELD, in reply, expressed the great pleasure he had felt for the deep interest taken in the subject which he had the honour to introduce to the notice of the Anthropological Institute. Much remained to be done in spreading accurate knowledge abroad on

the native races of the South Sea Islands. He was quite sure that the outrages of which we had heard so much of late would be heard of no more. But the Institute must be unremitting, alike in its humane as in its scientific labours, if these and other native races are to have their share in the beneficence of the progress which so signally marks our own time.

The following paper was then read by the Author:—

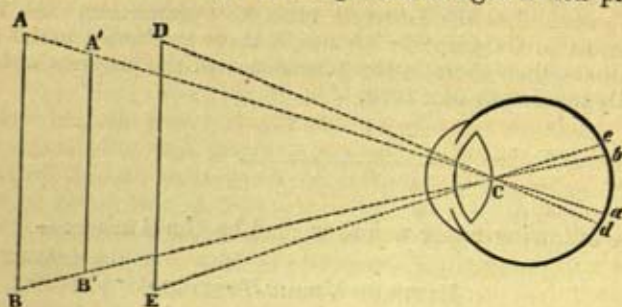
HINTS on VISION-TESTING.

By R. BRUDENELL CARTER, Esq., F.R.C.S.

THE circumstance that I have lately called attention to the effect of some of the conditions of civilisation upon the development of the eyeball, and upon the power of seeing, has called forth expressions of doubt with regard to the correctness of the popular belief that certain savage races are more keenly sighted than the generality of civilised men. As a matter of probability, I am disposed to think that this popular belief is well founded: first, because it rests on the testimony of writers who have been accustomed to observe with accuracy, and who have been little prone to give currency to mere marvels; secondly, because it is natural that the anatomical structure and functional excellence of the human retina, as of the retinae of the lower animals, should be favourably influenced by conditions which call for a high degree of sustained activity. There may, no doubt, be many savage races among whom these conditions do not exist; but they exist in a marked manner among others, and especially in countries in which the formation of the surface and the character of the atmosphere are favourable to distant vision, and in which the natives are accustomed to employ such vision for the purposes of hunting or of war. We may reasonably hope, however, if this Institute should determine that the question requires systematic investigation, shortly to see the facts placed beyond the reach of doubt; and my object in addressing you this evening is to offer a few suggestions with regard to the lines on which the investigation should be conducted, with regard to the points which it would be specially important to determine, and with regard to certain errors which it would be equally important to avoid.

It has long been customary to express acuteness of vision in terms of the visual angle. In the diagram (p. 122), if A B represents an object of vision, A C and B C are lines drawn from its

extremities to meet at a point within the eye, and may be taken to represent the axial rays of two pencils of light which proceed



from A and B respectively. The angle ACB is called the visual angle, and its magnitude is obviously dependent, partly upon the magnitude of the object, and partly upon its distance from the eye. The, smaller object, $A'B'$, being nearer to the eye than the object AB , subtends an angle of the same magnitude; while the object DE , which is equal to AB but nearer, subtends the larger angle DCE . The axial rays over-cross within the eye, and proceed to impinge upon the retina. If the diagram were a correct representation of the facts, the angle acb , formed by the axial rays after their over-crossing, would be equal to the angle ACB , formed prior to their over-crossing, and therefore, if we knew the magnitude of the angle ACB , and the distance of the crossing point from the retina, we should know also the magnitude of the retinal image. Hence, within certain limits, the magnitude of the retinal image depends upon the magnitude of the visual angle, and this again upon the size and distance of the object; and the commonly received view is that the limit of visibility depends upon the absolute size of the individual elements of which the perceptive layer of the retina is composed. The most sensitive of these elements, the cones of the retina, have a diameter of about four-thousandths of a millimetre across the inner portion, and of about one-thousandth of a millimetre across the outer portion; and it has been assumed that a retinal image does not become an object of sense perception unless it is large enough to cover the surface of a single element. This condition is fulfilled, apparently, in a well-formed eye, by the image of an object which subtends a visual angle of one minute, or even a little less, an angle of fifty seconds being the smallest under which the distinctness of two points is recorded to have been seen. This high acuteness of vision has only been attained under very favourable conditions of illumination; and, for clinical purposes, it has been found necessary to adopt an arbitrary and much lower standard.

The test-types in common use are so proportioned that, at some stated distance, they subtend a visual angle of five minutes in height, and an angle of one minute across their limbs or parts; and persons who can read them easily and correctly under these conditions are said to possess normal vision. This very moderate standard is constantly exceeded.

Lord Rayleigh has lately introduced a new element into the question, by suggesting that the defining power of the eye, as an optical instrument, is limited by its aperture and by the wavelength of light. He has published a rough calculation on which he founds the conclusion that the limit of sight would be reached under a visual angle of "about" two minutes. He stated that this limit had been "approached" by civilised physicists, and hence inferred that there was little room for uncivilised men to surpass them. It would be rash for me to assert that Lord Rayleigh is wrong in his principle, but he is obviously wrong in his application; for the limit which he assigns to vision is, as I have already stated, one which civilised physicists have not merely approached, but very far exceeded. There is, therefore, at the very least, a serious error in his calculation; and I may add that there is no such variation of visual acuteness, in relation to changes in the diameter of the pupil, as his hypothesis would seem to require. Without denying that there is an optical limit to the defining power of the eye, I am yet disposed to believe that this limit has no bearing upon the question at issue, and that the practical limit of visibility depends, in healthy and well-formed eyes, entirely upon the anatomical formation and the functional sensibility of the retina.¹

The next point to which I must call attention is that the conditions shown in the diagram are not of universal occurrence, and that the actual relation between the magnitude of the retinal image and the magnitude of the visual angle is by no means of a simple character. The dioptric system of the eye is complicated, and one effect of its complexity is that the point of divergence of the axial rays within the eye is not identical with their point of meeting, but is posterior to it. Moreover, the distance between the meeting-point and the point of divergence differs in different circumstances. A large proportion of eyes are so constructed that the focal length of their refracting media is identical with the length of the antero-posterior axis.

¹ After this paper was written, the error in Lord Rayleigh's calculation was pointed out in a letter to "Nature," and was acknowledged by his lordship. The optical limit of vision would only be reached under a visual angle of 28.9 seconds; and hence, as the finest seeing hitherto accomplished by a "civilised physicist" has been under an angle of 50 seconds, this best recorded performance represents scarcely more than one-half of the acuteness which would be theoretically attainable.

Persons who have such eyes are said to be emmetropic, that is, their eyes are in correct measure or proportion, and hence they possess the largest attainable range of functional activity. Persons whose eyes are not in this correct proportion are said to be ametropic, or out of measure; and ametropia presents two chief varieties, hypermetropia, in which the focal length is greater than the length of the antero-posterior axis, and hypometropia, commonly called myopia, or short-sight, in which the focal length is less than the length of the antero-posterior axis. Generally speaking, it may be said that hypermetropia, or flat eye, is a state of arrested development or of degeneration, and that myopia is a state of malformation, often originally inherited in some degree, but always aggravated by use and often complicated by disease. Both forms of ametropia are liable to be further complicated by astigmatism, a state in which the ametropia differs in degree in different meridians. In every variety of ametropia the cardinal points of refraction are disturbed, and different relations are produced between the visual angle and the divergence of rays within the eye. A similar disturbance is produced by the adjustment of the eye for near vision; and, moreover, in the ametropic, unless the defect is corrected by optical means, the result of the divergence of the rays is to produce upon the retina only a dispersion circle, or smudge, instead of a defined image. Before we can be sure, when comparing visual angle with visual angle, that we are also comparing retinal images of similar magnitude and clearness, we must completely correct ametropia by lenses, and must place our test objects at such a distance from the eye as to exclude adjustment for near vision. The smallest distance at which this can be done is 20 feet, within which range the divergence of the rays proceeding from a point becomes appreciable; and hence all so-called vision-testing, which has been conducted by objects placed less than 20 feet from the subjects, and without the careful correction of ametropia, may be dismissed from consideration, on the ground that there is no common measure for any results which may have been obtained. The external conditions having been the same, the conditions within the eyes would be too various to furnish materials for the judgment. To compare the vision of an emmetrope with that of an uncorrected ametrope, especially after testing them at a distance which calls some ocular adjustment into play, is to compare things between which there is no possible common measure.

In testing the vision of uncivilised men, it would manifestly be impossible for travellers, generally speaking, to undertake the correction of ametropia, which must therefore be excluded, as

far as possible, by selecting as subjects those persons whose vision is of the average quality of the race. Test-types must be rejected, not only because the subjects would be unfamiliar with the names and aspects of the letters, but also because these are not scientifically accurate, some of them being more legible than others. Single dots or marks, or dots or marks separated from each other by large intervals, must be rejected, because the power to discern a single dot does not depend upon acuteness of vision, but upon sensitiveness to small variations of light. The true test of acuteness is the power to separate two objects which are seen by the same visual act, and the best objects for this purpose are Burchardt's Internationale Sehproben, which consist of black circles or dots, arranged in groups, in such a manner that each circle is separated from the contiguous ones by intervals equal to its own diameter. The groups are numbered, the number upon each indicating the distance, in metres, or parts of metres, at which each dot subtends a visual angle of $2'15''$, equal to $1'56''$ English. Nothing larger would be required than the group the members of which subtend this angle at 6 metres, roughly 20 feet; and the method of proceeding would be to place the subject at a greater distance than this from the dots, and to cause him to approach until he could count the components of each group. The distance at which this could be done should be measured and recorded; and the experiment should be repeated often enough to exclude guessing or accidental sources of error.

Suppose a traveller to have established, in this way, that the acuteness of central vision, in an uncivilised man, was no greater than that which is often found among ourselves, he would still be only on the threshold of the inquiry. There would yet be three possible conditions which might confer upon the uncivilised man a far greater degree of real acuteness than the testing would suggest. He might have greater sensitiveness to colour, greater sensitiveness to light, and acute vision over a larger retinal area. Each of these advantages would confer upon him a much increased power of readily perceiving small and distant objects, and of discovering their nature.

The percipient elements of the retina, of which I have already spoken, are of two kinds, rods and cones, of which the latter are the more highly developed and the more sensitive. In the human retina, as far as it has been examined, there is a small central area, the seat of the most acute vision, in which the elements are all cones. In a zone immediately surrounding this area, each cone is surrounded by a single circle of rods. In portions of the retina still more peripheral, each cone is surrounded by a threefold or fourfold circle of rods. In the

retinæ of birds, the cones are much more abundant in proportion to the rods; as abundant, in the most peripheral parts, as they are in man in the immediate vicinity of the centre. Not only so, but the cones are of more specialised construction than in man, and each contains a coloured globule, evidently an organ which ministers to a highly developed colour-sense. In bats, on the other hand, there are no cones at all, and the retina is furnished only with rods. It is probable that analogous variations of structure, the results of modes of use extending over many generations, may occur in different families of mankind.

In order to test acuteness of colour-vision, I would suggest that travellers should be furnished with cards on the principle of Burchardt's tests, on which groups of dots should be painted in colours of very slight intensity, and that the distances at which the dots composing these groups could be counted should be recorded. The selection of the colours for this purpose, and the determination of the degree of saturation, would be matters requiring careful and detailed consideration.

In order to determine degrees of sensitiveness to light, I have had an instrument constructed, though only in a rough manner, for exhibition this evening. It consists of a tube, fitted to the orbit at one end, so as to preclude the entrance of light, and closed at the other end by a plug, upon which may be fixed a card, marked with lines, dots, or other figures. At one side of the tube is a shutter to admit light, which is diffused by passing through ground glass. The shutter should be slowly opened until the objects become visible, and the area of the opening can then be read off by graduations at the side. The objects used should include colour dots as well as black ones.

With regard to the last point, the area of retinal sensitiveness, we have abundant material for comparison. In civilised man, as a rule, the sensitiveness of the retina diminishes with much regularity as we leave the centre. For a distance of from one-fourth to one-third of a degree from the centre, it retains the central acuteness. At a distance of half a degree it is reduced from about four-fifths to about two-thirds of this acuteness. Up to an angle of 40 or 45 degrees, the reduction in the acuteness is progressive, and is expressed by a fraction which has unity for its numerator, and for its denominator a number ranging from twice to $4\frac{1}{2}$ times the number of degrees from the centre. Thus, at 15 degrees from the centre, the acuteness would be less than that of the centre in the ratio of from 30 to 67 to 1; and in farther distances the decrease is still more rapid. On the horizontal meridian, in the outer part of the field, the diminution of acuteness is less than elsewhere; and it is comparatively large on this meridian between the second and

the twelfth degree, that is to say, between the centre of the retina and the entrance of the optic nerve, but these differences may be disregarded for practical purposes. Lateral vision is tested by instruments called perimeters, some of which are very complicated, but I have had a simple perimeter constructed for the purpose of the investigation which we are now discussing. If the instrument is held by the angle, and the piece of wood is pressed against the chin, one eye being closed, any selected object of vision may be placed in the slide, and may be carried laterally, while the open eye is kept fixed upon the central point. Either black dots or coloured dots, or both, should be used as objects; and I should be quite prepared to find that both would be discernible, by the eyes of some savage races, in lateral positions in which they would be quite lost to the eyes of civilised men.

EYESIGHT of SAVAGE and CIVILISED PEOPLE.

By CHARLES ROBERTS, Esq., F.R.C.S.

THE proposal to test the relative eyesight of savage and civilised races is by no means a new one to English anthropologists. In the small volume of "Notes and Queries on Anthropology" drawn up by a Committee of the British Association, consisting of such well-known members of this Institute as C. Darwin, E. B. Tylor, Col. Lane Fox (Pitt Rivers), Dr. Beddoe, our President, and many others, tests and instructions are given for this purpose. These tests are the set of dots employed by our army surgeons for testing the (minimum) eyesight of recruits, and consist of a series of dots $\frac{1}{4}$ inch square, grouped in a variety of ways to prevent guessing or imposition on the part of the person under examination. These army test dots were largely used by the Anthropometric Committee of the British Association which closed its operations in 1883, but as the results in some instances were not satisfactory they were given up in favour of Snellen's test types. The objections to the use of the army test dots were (a) that some of the dots being placed at unequal distances from each other they were distinguishable at varying distances; and (b) the great distance at which the dots are visible to persons with good eyesight (theoretically 57 feet) in a great measure prevented their use in towns where sufficiently long and well-lighted ranges were difficult to find. Since the Anthropometric Committee issued its final Report I have analysed the returns of eyesight sent in, and after eliminating the observations which

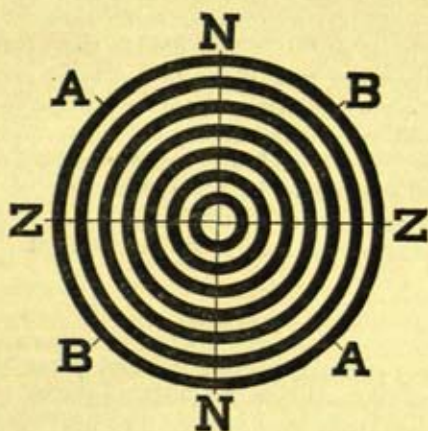
were known to have been taken under unfavourable conditions of illumination, the results appear to me to be quite trustworthy, as they conform when grouped in the usual manner to the well-known "law of error." The groups increase in a fairly uniform manner from four observations at and under 5 feet, up to 272 observations at 50–60 feet, and then diminish in a similar manner to four observations at 110 feet and upwards; the mean or largest group being, at 57·5 feet, identical with the theoretical distance at which the dots are visible to persons with good eyesight. The difference, moreover, between the eyesight of town folk and of country folk, as shown by these statistics, is barely 4 per cent. in favour of the latter, a difference which is probably to be accounted for by the better light in the country. These results would seem to show that the varying distances between the dots on the test card is not a vital objection to their use, as the result depends on the power of the eyes to separate the dots which are nearest together, and these are always separated by one diameter. It would be desirable, however, in altering these tests, or in devising new ones, to avoid this possible source of error and arrange the test objects, whatever form they may take, at equal distances from each other. [A diagram was here exhibited showing the effect of grouping the test dots at distances of one, two, three, four, and five diameters apart, and the increasing distances at which each set is visible.]¹

In arranging tests for eyesight sufficient attention has not been given to the interference with their use which astigmatism produces. This defect of sight is much more common than is generally supposed, being according to my experience rarely absent in adult persons, but has not received so much attention as other defects of sight because it does not in some of its forms materially interfere with the ordinary use of the eyes. In these cases there is a meridian of the eye which possesses the proper focal length lying between two portions which are imperfect. In the ordinary use of the eyes the meridian of good sight is made, by the rapid movements of the eyeball, to range over the object to which attention is directed and a sufficiently clear image of it is formed on the retina, but it is quite otherwise when the attention is fixed on a small object like a test dot or a test-type. In this case the test object becomes elongated in a direction at right angles to the meridian of good vision, and hence dots

¹ It must be borne in mind that these test dots are used in the British army as a *minimum* test, and any recruit who cannot distinguish them at a distance of 15 feet is rejected as unfit for military duties, as he would be unable to see a bull's-eye target 2 feet square at a distance of 600 yards. The instructions for carrying out this examination of recruits are unfortunately introduced in the "Notes and Queries," and they must be very puzzling to persons not accustomed to testing eyesight.

separated by only one diameter are seen together and assume the appearance of a continuous line before they disappear from sight by increasing distance. This common form of astigmatism is attributed to irregularities of the surface of the cornea, but there are other forms due to irregularities in the form of the lens which have received little attention from ophthalmologists, and which are often confounded with myopia, with which they have many features in common.

To eliminate the interference of corneal astigmatism with the use of small test objects, and as the direction of the meridian of good sight is not constant but varies in different persons, and possibly in different races, I have proposed the adoption of a series of concentric circles, which, as they embrace the whole field of vision, must be visible to astigmatic eyes in one direction, and in this direction therefore the lines may be counted. (See figure.) These circular diagrams are a most delicate test for all forms of astigmatism, apart from other forms of defective eyesight.



There are many reasons why we should hesitate to accept the statements often made relative to superiority of the eyesight of savages over civilised peoples till the sight of both has been submitted to some rigid test similar to those I have referred to. I have myself been much among savages (several tribes of North American Indians, Australians, and the Hill tribes of India) without noticing any remarkable manifestations of good eyesight apart from that which was due to a special knowledge of the objects observed. The travellers' tales on this subject are to be accounted for by faulty standards of comparison. Many—probably most—travellers are ignorant of the quality of their own eyesight, and

sailors, from whom many of the stories reach us, are a wonderful class, and not always the masters of their imaginations. The cases, moreover, which have been recorded are only those of persons who possess remarkable eyesight, and not the average of a large number of the same race living under similar conditions of life, and we do not know the best eyesight among civilised people with which to compare these cases. Eyesight equal to a visual angle of one minute has been accepted as the average of civilised persons, but this necessarily represents only half the acuteness of vision which some persons possess. Inspector-General Lawson, recording his own experiments in the Report of the Anthropometric Committee for 1881, tells us that he could at one time distinguish a flagstaff at Aldershot, the smaller diameter of which was 6 inches, at a distance of three miles, under favourable conditions of the atmosphere, the visual angle subtended being only 6·7 seconds, or a ninth part of the commonly received visual angle of one minute; and he further states that it could be seen by other persons under similar conditions. Among the observations collected by means of the army test dots already referred to, four men are returned as seeing them at 110 feet and upwards, that is to say, at about double the average distance. It is obvious, therefore, that if the test is to be one of who can see objects at the greatest distance, we must begin by ascertaining the best eyesight to be found among ourselves. This would be, however, a very difficult and unscientific method, and it is only by obtaining the averages of a large number of observations among savages and among civilised races, and comparing them together, that any useful results can be obtained.

DISCUSSION.

The PRESIDENT remarked, before the first paper was read, that the question of the relative keenness of sight of savage and civilised races had lately been brought prominently into notice by Mr. Brudenell Carter. It concerned a matter of fact, and was one which this Institute might legitimately undertake to get solved. The question was not as to the greater quickness of observation and of perception of the savage, because on that point all were agreed; but whether his eye, as an optical instrument, was superior to that of a civilised man. To solve this question, satisfactory tests had to be thought out equally suitable for use in savage and civilised countries, and if this could be done there was little doubt that this Institute was capable of inducing many travellers to apply them.

After the reading of the papers, the PRESIDENT expressed his satisfaction at finding that there was a concurrence of opinion on one essential point, namely, on the superior merits (under clearly explained conditions) of test dots or circles. He himself thought

that for the purpose of travellers the number of those dots should be limited to one or two. He exhibited a thin octagon zinc plate, 5 inches in width, with holes in it to which paper test circles, of whatever construction might be adopted, could be attached by threads. The plate would be propped on one or other of its eight sides, giving that number of varying test positions.

ANTHROPOLOGICAL MISCELLANEA.

ETHNOLOGICAL NOTES on the ARABS of ARABIA PETRÆA and WÂDY ARABAH.

By E. GORDON HULL, M.D., B.A.

THE principal tribe inhabiting the Sinaitic peninsula, south of the Hadj road from Suez to Akabah, is the Towara, and amongst them I spent some weeks in the winter, 1883-4, while assisting my father, Professor Hull, to make a geological survey of the country for the Palestine Exploration Fund; the other tribe with which we came in contact being the Alawin, who live in a territory bounded on the north by Wâdy-Mûsa and Petra, on the west by Wâdy Arabah and Gulf of Akabah, and which extends somewhat indefinitely east and south. Their Chief, Muhammed Ebn Jad, is subsidized to protect the Egyptian Hadj.

We also encountered the clan which inhabits the Wâdy Mûsa, who appear to be of quite a different race. Their skin is very much fairer than that of the Arabs, they are considerably taller, and most of them have aquiline noses—in fact they look rather like Jews. The Arabs look down on them, because they cultivate the land, calling them "Fellaheen," and it is rather a problem as to where they came from. With regard to the Towara, it may be said that they are a small race, but their limbs and bodies are well formed and proportioned, and they are capable of enduring great fatigue on a diet consisting principally of boiled rice and butter, with unleavened bread, coffee, dates, and water.

I measured twenty-six adult males, picked men of the tribe; taking three measurements, that is, height, chest round nipple, and length of right arm from acromion to tip of middle finger. The average height was 5 feet $4\frac{1}{2}$ inches; average chest-measurement, 31 inches; average length of right arm, 27.6 inches. The maximum chest-measurement in a man of 5 feet 11 inches was only $34\frac{1}{2}$ inches, and the minimum in one of 5 feet was 30 inches. Yet with such insignificant chests they were splendid pedestrians and mountaineers, and did their day's march without a murmur. Certainly, they were all in very good condition, for I do not suppose there was an ounce of fat among the whole tribe.

The following are the detailed measurements. As they had an objection to being quite stripped, I put the tape round their chests over their thin calico shirt, so that the measurements are slightly in excess, .25 to .5 of an inch.

The chest-measurements were taken at the level of the nipples, with the arms down by the side, at the end of expiration.

No.	Age.	Height.	Chest-Measurement.	Length of Right Arm.	Remarks.
	years.	ft. and ins.	inches.		
1	28	5'11	32·5	30	All adult males. Chest-measurement round nipples. Right arm from tip of acromion to tip of middle finger. Height in feet and inches, other measurements in inches.
2	25	5'1½	31·5	26·25	
3	25	5'5½	31·5	27·5	
4	25	5'7½	32·25	28	
5	50	5'5	31	27·75	
6	50	5'1½	31	26	
7	26	5'2	30	26·5	
8	30	5'2½	30·5	25·5	
9	23	5'5½	33	26·75	
10	26	5'2	30·5	26	
11	26	5'6½	31	27·5	*No. 15 a <i>Sheik</i> .
12	33	5'4	33	27·75	
13	37	5'7	32	29·75	
14	42	5'7	31·5	28·25	
*15	40	5'3½	32·5	26·	
16	33	5'4½	30	27·5	
17	21	5'2½	33·5	20·5	
18	36	5'10	34·25	29·5	
19	30	5'8½	33	28·25	
20	38	5'3	33	26·5	
21	24	5'2½	31·5	27·5	
22	45	5'4½	30·5	26	
23	35	5'5½	33	28	
24	35	5'3	31·5	27·25	
25	25	5'3½	33	26·75	
26	30	5'4	32	28·5	

With some difficulty, and aided by the omnipotent backsheesh, I procured a skull from one of the native graveyards, which I sent to Dr. Alex. Macalister, Professor of Anatomy at Cambridge, who kindly gave me the measurements, which are as follows. He says:—

"It is the skull of an old female.

Length	176 mm.	} dolichocephalic index .. 682 hypsiccephalic height index .. 716
Breadth ..	..	120 "
Height ..	..	126 "
Nasal height	48 "	} nasal .. 458
" width ..	..	22 "
Orbital height	33 "	} orbital .. 892
" width ..	..	37 "
Basi-alveolar length	84 "		} alveolar .. 884
" -nasal	95 "		

Capacity 1,120 cubic centimetres."

Dr. Macalister adds: "It is interesting that a somewhat similar skull, 181 mm. long, 119 mm. broad, 121 mm. high, and 1,100 cc. in capacity, was dug up in an alluvial bed at Sinai, and is now in the Hunterian Museum, No. 675."

The most startling point in these data is the extremely small

chest-measurement of this tribe of Arabs, which is so low as to be almost pathological. One modifying circumstance, however, is to be found in their extreme leanness, amounting to semi-starvation, and possibly their lung-space may be more extensive from above downwards than with us.

I will pass over the Alawin tribe in a few sentences, as I regret to say I did not measure them so extensively as I did the Towara. I measured some with regard to height alone, and the average I got was 5 feet 2 inches, but possibly this is too low, and 5 feet 3 inches would be safer.

Their muscles, especially of the upper extremities, were very poorly developed, while they nearly all, except the sheik, exhibited marks of inferior intelligence; about five or six out of our twenty men were decidedly half-witted, and all of them had the habit, common among such people, of repeating over and over again everything that is said to them, or that they say to one another. They appeared half-starved, and used to chew continuously the dried beans provided for the camels. They have splendid teeth, very firmly fixed in the jaw, and their sight is remarkably keen. They nearly all turn in their toes when walking.

I should remark that these tribes with whom we came in contact seem to be below the average Arab, as far as physique is concerned. Sergeant Armstrong, who was with us, and has worked for many years in Palestine and been among the tribes on the other side Jordan, says that *they* are a much finer race of men, and Mr. Merrill, the American Consul at Jerusalem, who explored the East of Jordan for the American Society, corroborates his opinion. Possibly the fact that the Towara are a small tribe, and are not allowed to marry out of it, may partially account for their deterioration.

Owing, no doubt, to their habits, the Arabs seem to be most subject to the diseases due to exposure; but as far as I could judge, these diseases have a tendency to the chronic or subacute form, rather than the acute. Two I particularly noticed as almost universal, that is, chronic bronchitis, of a dry kind, and without emphysema; and chronic articular rheumatism.

The first cannot fail to force itself on every traveller's attention, as it gives rise to a peculiarly irritating paroxysmal cough, rather canine in character, which, as the Arabs sat round our tents at night, often disturbed our slumbers. The second, that is, rheumatism, I noticed when taking the measurements of a series of the men; nearly all their shoulder-joints creaked and groaned as they raised them; and this will account for the curious inability of the Arabs to move about or do any work in the morning before they are "thawed," and rendered supple either by fire or by sun. It seems, at such a time, as if all their joints were temporarily ankylosed, so stiff and unpliant are they.

In certain districts, notably Akabah, they suffer from ague, but this disease is not common among the Arabs proper. The late Professor Palmer states that "they are sometimes visited by an

epidemic, not cholera, probably the plague, which they call 'the yellow pest.' It comes with the hot winds, and strikes them down suddenly in the midst of their occupation, but it is said never to attack the country of our Lord Moses, where grow the shiah and the myrrh, that is, the elevated granite-region about Mount Sinai."

They use a few of the native plants for medicinal purposes, but only a few, in comparison with the rather large supply of plants with pretty decided properties. For instance, they do not know the value of the castor oil plant, which grows freely in the Ghor es Safieh.

However, several species of wild melon, of the family *Bryonia*, allied to the *Elaterium* (which also grows in these parts), are in common use as purgatives; the native method of using them is ingenious. A fruit is split into halves, the seeds scooped out, and the two cavities filled with milk; after allowing it to stand for some time, the liquid, which has absorbed some of the active principle of the plant, is drunk off. A milder remedy is camel's milk, which appears, under some circumstances, to be purgative to the Arabs.

The order *Compositæ* furnishes several medicinal herbs of which the Arabs make use. The *Santolina fragrantissima*, a graceful plant of a sage-green colour, bitter taste, and strong fragrant smell, furnishes them, in the form of an infusion, with a carminative, good for colic and all painful affections of the abdomen. In the bazaars of Cairo the fragrant dried heads are sold for the same purposes as camomile. I was told that there are no snakes in the districts where the plant grows: and the natives believe that the smell of the plant is sufficient to drive reptiles from a house, and it is used for this purpose in Cairo and other towns.

Another plant of the same order is an *Artemisia*, or wormwood with a very strong aromatic odour and bitter taste. The fellaheen use it to put in their bedding to drive away vermin.

A very striking plant, which often hangs in graceful dark green festoons from the granite walls of the gorges of Arabia Petrea, is the caper plant (*Capparis spinosa*). The natives are very fond of the fruit, which has a warm aromatic taste, and they stroke the region of the epigastrium appreciatively after eating one or two. The cortex of the root is said to be aperient and diuretic. Another fairly common plant is a *Hyoscyamus*, called by the natives sekharan, with fleshy leaves and purple flowers. The dried leaves are used by the natives to smoke, and produce a kind of intoxication or delirium; and an infusion of the fresh leaves possesses strong narcotic properties. It is nearly allied to the mandragora, which becomes common on the limestone downs in the south of Judæa. The Arabs are extraordinarily susceptible to narcotics. Our tobacco they could not smoke at all; a few whiffs make them giddy, and give them a headache; even a "Richmond Gem" cigarette is too much for them. Only two mineral substances appear to be regarded by the Bedawin as medicinal. One of them is sulphur, the other is a kind of common red coral, found on the

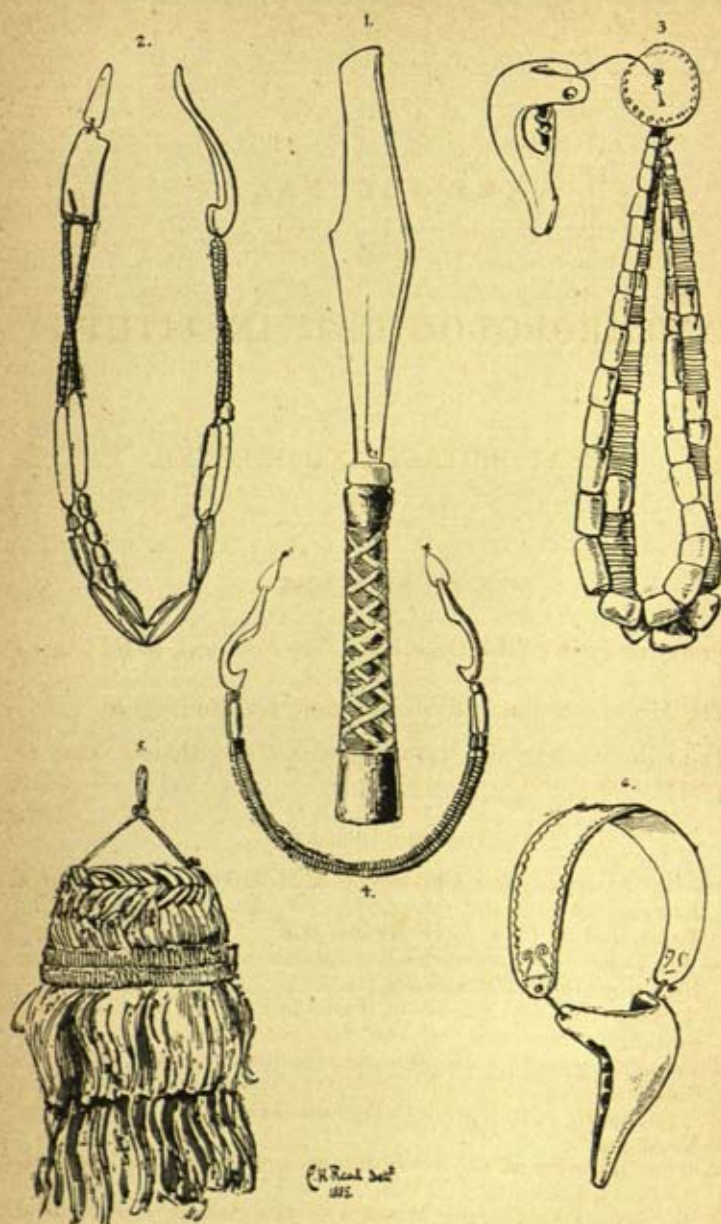
shores of the Red Sea and Mediterranean, and sold in the bazaar at Gaza. As far as I could gather, they only use this as a charm.

My remark about the keen sight of the Wâdy Arabah Arabs is not founded on any actual measurements; we thought that their discrimination of distant objects was superior to our own. On the other hand we considered ourselves superior to the Towara or Sinaitic Arabs, but so many of them had suffered from ophthalmia that they were hardly normal specimens. And, of course, with regard to the Alawin the objects were not unfamiliar to *them*.

ANTHROPOLOGICAL MEETINGS DURING THE AUTUMN.

THE fifty-fifth meeting of the British Association for the Advancement of Science will be held at Aberdeen under the Presidency of the Right Hon. Sir Lyon Playfair, K.C.B., F.R.S., commencing on Wednesday, September 9th. The Anthropological Section will be presided over by Mr. Francis Galton, F.R.S., the President of the Anthropological Institute.

The fourteenth meeting of the French Association for the Advancement of Science will be held at Grenoble, from the 12th to the 20th of August. The Anthropological Section will be presided over by M. Philippe Salmon. One of the most interesting subjects to be discussed at this meeting relates to the reputed Miocene anthropoid of Thenay—a subject which attracted much attention at the meeting held last autumn at Blois. M. d'Ault Dumesnil will describe the geological characters of the sections which were specially opened last September, in order to determine the precise age of the flint-bearing beds, and M. Daleau will exhibit and describe the flints obtained from these excavations; while a Committee appointed to inquire into the curious crackled surface of the Thenay flints will present its report. The subject of Tertiary Man will also be discussed by Prof. G. de Mortillet. M. E. Chantre will describe the prehistoric relics of Dauphiné, the district in which the meeting is to be held; and M. A. Villot will read a dissertation on the Antiquity of Man in the Alps of Dauphiné.



OBJECTS FROM THE AKKAS, NORTHERN ASSAM (about $\frac{1}{2}$ linear)

THE JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.

APRIL 14TH, 1885.

Professor FLOWER, LL.D., F.R.S., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From the AUTHOR.—The Chittagong Hill Tribes. Results of a Journey made in the year 1882. By Emil Riebeck, Ph.D. Translated by Prof. A. H. Keane, B.A.
- Les Derniers Voyages des Néerlandais à la Nouvelle-Guinée. By Prince Roland Bonaparte.
- Descriptive Catalogue of the Goodwin Ethnological Collection, containing rare and valuable specimens from New Guinea and other islands, with photographic illustrations. By A. P. Goodwin.
- The Liberty of Independent Historical Research. By Thomas Kerslake.
- The Detection of Colour-Blindness and Imperfect Eyesight. By Charles Roberts, F.R.C.S.
- Elephant Pipes in the Museum of the Academy of Natural Sciences, Davenport, Iowa. By Charles E. Putnam.
- Iperostosi in Mandibole Umane specialmente di Ostiacchi ed anche in Mascellari superiori. By Dr. Jacopo Danielli.

- From the AUTHOR.—*Sopra due Cranii Italo-Greci.* By Michele Centouze.
- *Manufatti preistorici di America esistenti nel Gabinetto di Antropologia della R. Università di Napoli.* By Michele Centouze.
- From the REGISTRAR-GENERAL OF VICTORIA.—*Patents and Patentees.* Vols. XIII, XIV. Indexes for the years 1878, 1879.
- From the SOCIETÀ ITALIANA DI ANTROPOLOGIA.—*Archivio per L'Antropologia e la Etnologia.* Vol. XIV, Fas. 3.
- From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE.—*Correspondenz-Blatt.* March, 1885.
- From the LIBRARIAN OF THE MITCHELL LIBRARY, GLASGOW.—*Report,* 1884.
- From the SEC. DE FOMENTO.—*Anales Estadísticos de la Republica de Guatemala.* Año de 1883; Tomo. II.
- From the SOCIEDADE DE GEOGRAPHIA DE LISBOA.—*Resposta à Sociedade anti-esclavista de Londres por J. A. Corte Real.*
- From the R. AKADEMIE VAN WETENSCHAPPEN, AMSTERDAM.—*Verslagen en Mededeelingen.* Afd. Natuurkunde. Tweede Reeks. Deel. XIX, XX.
- *Naam- en Zaakregister op de Verslagen en Mededeelingen.* Afd. Natuurkunde. Tweede Reeks. Deel. I-XX.
- *Jaarboek.* 1883.
- *Processen-Verbaal van de Gewone Vergaderingen.* Afd. Natuurkunde. Van Mei, 1883, tot en met Maart, 1884.
- From the ACADEMY.—*Boletín de la Academia Nacional de Ciencias en Córdoba.* Tom. VIII, Entrega 1ª.
- *Atti della Reale Accademia dei Lincei.* Serie Quarta. Vol. I, Fas. 7, 8.
- From the ASSOCIATION.—*Transactions of the National Association for the Promotion of Social Science.* 1884. Birmingham.
- From the INSTITUTE.—*Proceedings of the Canadian Institute,* Toronto. Third Series, Vol. III, Fas. 1 [No. 142].
- From the SOCIETY.—*Journal of the Royal Asiatic Society.* Vol. XVII, Part 2.
- *Proceedings of the Royal Geographical Society.* April, 1885.
- *Proceedings of the Society of Antiquaries of Scotland.* *1883, 1884.
- *Journal of the Society of Arts.* Nos. 1688-1690.
- *Bulletins de la Société d'Anthropologie de Paris.* Tom. VII, Fas. 5. December, 1884.
- *Bulletin de la Société de Borda,* Dax. 1885, No. 1.
- *Bulletin de la Société Impériale des Naturalistes de Moscou.* 1884, No. 2.
- *Mittheilungen der Anthropologischen Gesellschaft in Wien.* Band XIV, Heft 4.
- *Boletim da Sociedade de Geographia de Lisboa.* 4ª Serie. Nos. 10, 11.
- *Annual Report of the Council of the Yorkshire Philosophical Society for 1884.*

- From the EDITOR.—“Nature.” Nos. 804, 805.
—— Journal of Mental Science. No. 97.
—— Revue d’Ethnographie. 1884, No. 6.
—— Bullettino di Paletnologia Italiana. 1884, Nos. 11, 12.
—— “Science.” Nos. 111, 112.
—— Revue Scientifique. Tom. XXXV, No. 13.
—— Revue Politique. Tom. XXXV, No. 13.
—— The Midland Medical Miscellany. No. 40.

The election of the following new members was announced :—

JOHN BROWNE, Esq., JAMES G. FRAZER, Esq., M.A., and HELLIER R. H. GOSSELIN, Esq.

EXHIBITION of ETHNOLOGICAL OBJECTS *from the* AKKAS,
NORTHERN ASSAM.

[WITH PLATE V.]

MR. CHARLES H. READ, F.S.A., exhibited on behalf of A. W. Franks, Esq., F.R.S., a small number of personal ornaments from the Akkas or Angkas, a small tribe living on the hills on the northern frontier of Assam, between Bhotan and the Daffa country.

A full account of the Akkas is given by the Rev. C. H. Hessemeyer in the “Journal of the Asiatic Society of Bengal,” Vol. XXXVII, p. 194. From this it appears that the name by which they call themselves is not Akka but Hrusso, and that their traditions point to their having immigrated from the plains.

Mr. Hessemeyer’s account is so easy of access to members of the Institute that it would not be worth while to repeat the facts here. The reason, however, why it has been thought desirable to figure some of the specimens exhibited, is that in 1866–7 the number of Akkas then living was but a thousand souls, and the probability is that even if their numbers do not greatly decrease, they may disappear as a tribe.

It should be premised that the objects figured are probably not all of Akka manufacture, for though they are industrious husbandmen, their manufactures are very few. These objects greatly resemble the ornaments worn by some of the Nagas of Assam, but there seem differences in form and detail, and in most cases the Akkas would carry off the palm for elegance of form and perfection of finish.

All the specimens figured have since been presented to the British Museum by Mr. Franks.

¹ The Council is indebted for this Plate to the kindness of A. W. Franks, Esq., M.A., F.R.S.

Explanation of Plate V.

- Fig. 1. A *dha*, resembling the Naga form. The blade is bevelled at the edge on one side only, and is somewhat concave on the other. A wooden handle bound with plaited cord, over which a binding of bright yellow strips of leaf, producing a lozenge pattern.
- Fig. 2. Necklace, of beads of green, blue, and yellow glass; bugles of white shell, and long pointed and faceted beads of cornelian; the ends are formed of sections of a large white shell slightly ornamented with dots.
- Fig. 3. Double necklace made entirely of beads of white shell; one necklace consists of graduated cylinders, the other of discs of shell alternating with similar cylinders. At the upper end of the necklace is a circular piece of shell with a border of circles containing dots, and attached to this is a section of a large white shell, pierced for suspension at the two points. This resembles a similar ornament worn by the Nagas on the nape of the neck, and is apparently worn in the same position.
- Fig. 4. Necklace resembling Fig. 2. The small beads in this are all of glass, chiefly of an opaque jasper-like red; the bugles and the ornaments at each end are of white shell.
- Fig. 5. Armlet of plaited rattan, mixed with strips of bright yellow leaf; below are two rows of *coix* seeds, and from the edge springs a double fringe of hair, the upper half being red, and the lower hangs to twice the length and is black.
- Fig. 6. Head band. A broad strip of brass, with slight punched ornament consisting of a scalloped border, and at each end a triangular design with spiral terminations. To this is fastened a section of white shell, similar to that of Fig. 3, and which in this instance would be worn on the back of the head.
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The following paper was read by the author:—

On the INHABITANTS of TIERRA DEL FUEGO.

By J. G. GARSON, M.D., F.Z.S., M.A.I., Lecturer on Comparative Anatomy, Charing Cross Hospital; Royal College of Surgeons of England.

[WITH PLATE VI.]

THE archipelago of Tierra del Fuego is situated at the southern extremity of the continent of South America, from which it is separated by the Straits of Magellan, and lies between 64° and 75° S. long. and 53° and 56° S. lat. Its position as regards latitude therefore corresponds to that portion of England lying between Nottingham and Berwick, with this important difference, however, that Tierra del Fuego is in south and England in north latitude. It consists of several islands of very different sizes, the most important being King Charles' South-land, which is by far the largest of the group, and that which is usually referred to when Tierra del Fuego is spoken of, Staten Island, Hoste or Usin, Dawson, Clarence, Ines, and Desolation Islands, this last being the furthest west.

In general contour the coast-line is extremely irregular owing to the numerous bays and inlets of the sea, which run into and break up the land, the various islands being separated from one another by narrow and often tortuous channels and straits. The surface of the land is extremely mountainous and rugged. Trees clothe all the lower slopes of the mountains to the height of 1,500 feet, when they suddenly cease and are followed by a band of peat extending to the snow-line, which is at an altitude of between 3,000 and 4,000 feet in this part of the world. Many mountain ranges are covered with perpetual snow.

I have been unable to ascertain the area of the country, but from the information I have been able to gather, it does not appear to be less than that of England.

The climate, besides being cold, as indicated by the lowness of the snow-line on the mountains, is extremely variable, sudden and violent storms of wind and rain and snow occur frequently, and a fall of snow is not uncommon in the height of summer. Cold, wet, and windy weather seems to have been experienced by every one who has visited Fuegia.

Although Fuegia has been frequently visited by Europeans ever since its discovery by Magellan, far less is known regarding its inhabitants than might have been expected. The most complete account of the ethnology of the archipelago is that given by Captain Fitzroy in the "*Voyages of the Adventurer and Beagle.*" Since that work was published several short notices have ap-

peared in narratives of various voyagers, and in letters from missionaries sent out by the South American Missionary Society, especially those of the Rev. Thos. Bridges, to whom we are greatly indebted, not only for much valuable information regarding the people, but also for most of the skeletons and skulls the description of which will form the chief subject of this communication.

Before beginning the anatomy of the Fuegians I have thought it desirable to give a *resumé* of the knowledge we possess regarding them and their social customs.

The inhabitants of Fuegia are scattered along the coasts and are usually to be found located at the heads of bays and creeks in sheltered spots; the interior of the country is, as far as we know, uninhabited. The Fuegians never possess fixed places of abode or villages, but wander about in small detachments from place to place, constructing, during their temporary residence at any place, shelters, called wigwams, of the branches of trees. They travel from place to place chiefly in their canoes, which are to them what horses are to the Patagonians. The only domestic animal they possess is the dog.

Captain Fitzroy describes four different tribes inhabiting the Fuegian archipelago; they are—1st, the Yacana-Kunny tribe, now called the Onas, who inhabit the north-eastern, eastern, and south-eastern shores of King Charles's Land as far as Sloggett Bay; 2nd, the Tekeenica tribe, now called the Yahgans, inhabiting the shores of the Beagle Channel and the islands to the south of it; 3rd, the Alikhoolip tribe, now called the Alaculoofs, who occupy the western islands from Stewart Islands to Cape Pillar; 4th, the Pecheray tribe, a name given by Fitzroy to the people dwelling on the shores of the central part of the Straits of Magellan, but of whose existence as a distinct tribe I am unable to find any confirmation in the writings of Mr. Bridges or others. Information on this point is very desirable.

The Onas are a tall stout race of men, of a redish brown colour, resembling the inhabitants of Eastern Patagonia, of whom they are now generally considered to be a branch. They clothe themselves in long loose mantles extending from their shoulders to their ankles, made of the skin of the guanaco, the flesh of which appears to be their principal article of food. Those in the southern part of the island were found by Mr. Bridges "living apart, family by family. In ordinary weather they are content with the shelter of a few guanaco skins to shut off the wind, nothing overhead or to leeward save the foliage of the trees. They also much frequent caves and any shelter afforded by overhanging rocks. Their language is very jerky and guttural, difficult to pronounce and to determine its spelling." Where the guanaco is scarce, and as a variety in their food where that

animal is more abundant, they live largely on shell-fish, fish, and seals, also "on a considerable variety of strange food, half animal and half vegetable, they find washed up on their coasts."¹ Among the eastern and southern Onas a large mixture of Yahgan women are to be found who are known not only by their language but by being shorter than the Ona women. The weapons used by the Ona tribe are bows and arrows, balls (*bolas*), slings, lances, and clubs, and their chief employment is hunting.

The Yahgan tribe is the best known to us, through the South American Missionary Society having chiefly directed its energy towards their civilisation, and that with very considerable success. They were considered by Fitzroy and Darwin to be amongst the most degraded of savages, and have been graphically described by Fitzroy² as "low of stature, ill-looking, and badly proportioned. Their colour is that of very old mahogany, or rather, between dark copper and bronze. The trunk of the body is large in proportion to their cramped and rather crooked limbs. Their rough, coarse, and extremely dirty black hair half hides, yet heightens, a villainous expression of the worst description of savage features. . . . They suffer little hair to grow excepting on their heads. Even their eyebrows are almost eradicated, two mussel shells serving for pincers. . . . Sometimes these satires upon mankind wear a part of the skin of a guanaco or a sealskin upon their backs, and perhaps the skin of a penguin or a bit of hide hangs in front; but often there is nothing to hide their nakedness or to preserve warmth excepting a scrap of hide, which is tied to the side or back of the body by a string round the waist. Even this is only for a pocket, in which they may carry stones for their slings and hide what they pick up and pilfer. . . . Women wear rather more clothing than the men. . . . Neither men nor women have any substitute for shoes." No ornaments are worn in the nose, ears, or lips, nor do they tattoo themselves; but both sexes are fond of necklaces and bracelets, which are usually made of shells or pieces of birds' bones. They rub themselves over with grease or oil, and paint their faces and bodies of various colours with ochre, clay, or charcoal. The weapons of this tribe are small lances headed with wood or bone, bows and arrows headed with stones, clubs, and slings. Their wigwams are of a conical form, with two openings or entrances, exactly opposite each other, and made of a number of long poles or young trees, placed touching one another in a circle, with the small ends meeting in the centre; sometimes a few branches of grass or pieces of bark are laid against the side exposed to the wind. In the centre is the hearth, on which

¹ "South American Missionary Magazine," October, 1812, p. 125.

² "Voyage of the Adventurer and Beagle," vol. ii, p. 137.

a wood fire burns, and surrounding it a few branches or handfuls of grass form places of repose for the inmates during the night.

Their canoes are made of several large pieces of bark, sewed together and kept from collapsing by sticks placed transversely across; in the bottom of the canoe is placed a quantity of mud or clay, on which a wood fire burns in the middle. The usual dimensions of a canoe is about 15 feet long and nearly 3 feet broad. The sea furnishes this tribe with their principal food, which consists of shell-fish, fish, birds and their eggs, seals, porpoises, and other Cetacea, and indeed anything they can obtain. The guanaco does not exist in many parts of their country; where it is found they hunt it with dogs in the snow during the winter months.

The Alaculoofs seem to resemble the Yahgans very closely in their physical characters and mode of life. Fitzroy, however, states that they are superior to them, being the stoutest and hardiest, and the women the least ill-looking of the Fuegians. They make their wigwams beehive-shaped, and frequently excavate them within. They also clothe themselves better than the Yahgans. More information is wanted, however, regarding them.

The Pecherays, if they exist as a distinct tribe from the other two as stated by Fitzroy, seem to be as miserable as the Yahgans, and to lead a life very similar to theirs. They construct their wigwams of a beehive shape like the Alaculoofs.¹ More information is, however, wanted regarding them also.

The Fuegians do not seem to have any form of government, superiority of one over another being acquired by age, sagacity, or daring conduct. In families, and in the small clans into which the tribes are broken up, the word of the old men is accepted as law by the younger people.

They marry young, and among the Yahgans and Alaculoofs bigamy is common. In order to procure a wife a youth has to obtain the consent of her relatives and do some work for them, such as to assist in building a canoe. Then, having procured one for himself, he watches his opportunity and carries off his bride. Should she object to the suit she hides herself in the woods and avoids him till at last she gets rid of him.

When a person dies, his relatives wrap the body up in skins and carry it a long way into the woods, where they place it on pieces of wood, and pile a quantity of branches over it. They also in some places deposit their dead in caves. Fortunately, they can be easily induced to part with the bones of their deceased relatives, according to Captain Bové, which it would

¹ I am inclined to believe that Mr. Bridges considers the Pecherays a branch of the Alaculoofs.

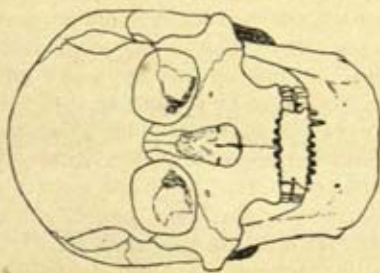


Fig. 1. Norma Frontalis.



Fig. 2. Norma Lateralis.

be well for those Europeans in Fuegia interested in the advancement of science to take advantage of, as osteological specimens of Fuegians are rare in our museums.

They believe in the existence of a spirit, in the form of a great black man, who is supposed to wander about the woods and mountains, and from whom they cannot escape. This being knows their words and actions, and when they do wrong sends storms of hail and snow. They are extremely superstitious.

Fire is maintained with great care wherever these savages go, by carrying about a piece of burning wood. Should it accidentally become extinguished they procure it again from sparks produced by striking two stones against one another. The sparks so produced are received into tinder made from the underdown of birds, well dried, or fine dry moss, and then by fanning the lighted tinder in the air a flame is produced and the fire is again kindled.

The employment of the men is hunting in the places where land animals exist, and procuring porpoises, seals, otters, &c.; they cut wood for the fires, build canoes and wigwams, and at night go out to catch birds. The women nurse the children, attend the fires, make baskets, fishing and water-buckets and necklaces; they gather shell-fish, dive for sea eggs, look after the canoes, and go out fishing in them, and paddle the men about. Both men and women are expert in swimming, which they do after the manner of dogs.

Regarding their life in the wigwams, Captain Bové says: "At night the fire is fed to the fullest possible extent, and around it, with their bodies almost in the ashes, lie the wretched inmates. When the family is numerous they dispose themselves in a line, one pressing against the other, and the last one covering his back with a rug of guanaco or sealskin. Cases of horrible burns are not infrequent."¹ When not pressed for time the natives roast shell-fish and half roast other kinds of food, but when hurried they eat fish and meat raw. The oil and fat or blubber of seals and porpoises are cut off the carcass and eaten, even though somewhat putrid. They have little or no vegetable food. Their drink is pure water, which they take in large quantities. Captain Fitzroy seems to have satisfied himself in 1832 that when much pressed for food, and after battles, they resorted to cannibalism, but we have no later information regarding this practice.

The languages of the various tribes seem to be different, and to contain several dialects; that of the Yahgan tribe is the best known to us. They have a great facility in pronouncing and

¹ "South American Missionary Magazine," October, 1883, p. 234.

repeating words and sentences of languages they are totally unacquainted with, and their power of mimicry seems to have attracted the attention of several travellers.

Population.—Regarding the number of people who inhabit the Fuegian archipelago, comparatively little is known, except of the Yahgans, of whom Mr. Bridges has lately made a census,¹ and finds that they include a population of about 1,000. Of these, 273 are men, 314 are women, and the remainder children and infants. He estimates the Ona population as not to exceed 500, the Alaculoofs and other likely tribes between them and Chilöe to number about 1,500, making the total population of the archipelago about 3,000 persons. The rate of mortality among the Fuegians is high, and it has been noticed by several travellers that there are very few old people, or people with grey hair amongst them, which I take to be a significant fact in connection with the duration of human life. The great scarcity of food, the toil with which it is procured, the severity of the climate, and their very inefficient protection from the elements, both in clothing and shelter, necessarily render the struggle for existence great, and elevate considerably the standard of fitness for survival.

We now pass on to consider the physical characters of the people. Speaking of them as a whole, Fitzroy and Bové are unanimous in their accounts that the most notable characteristics they present are, an extremely small low forehead, prominent brows, small sunken black eyes, wide cheek-bones, wide and open nostrils, large mouth, thick lips, and the face, as a whole, flat. The eyelids are usually red and watery from the irritation of the wood smoke in their wigwams. The chin varies in form, being smaller and less prominent in some than in others. The nose is always narrow between the eyes, and concave or almost flat in profile outline, except in a few instances. The teeth are fairly large, but often worn down in front till the dentine is exposed, consequently giving them an appearance similar to those of an aged horse. The hair is coarse and lank, and grows regularly over the head. It is said not to fall out or turn grey until they are very old. Little or no hair is allowed to grow on the eyebrows or face, it being carefully depilated from those parts. As exceptions to the general rule, Captain Fitzroy states that he has seen individual men and women occasionally with frizzly or curly hair, high foreheads, and straight aquiline noses. These, however, appear to have been people who have been shipwrecked or otherwise accidentally imported. They are mentioned by Captain Bové as having been seen by him. The

¹ "South American Missionary Magazine," October, 1884, p. 223.

neck of the Fuegian is short and strong, the shoulders square and high, the chest and body large, the limbs short and slim compared to the size of the body. Most of the people are bow-legged, the knee is strained by the custom they have of always sitting squat, and when straightened the skin covering it hangs in loose folds; the muscles of the thigh are large, but those of the leg are small. The hands and feet are small, the latter perfectly undeformed, never being covered with boots. The colour of the skin varies from a mahogany to a bronze hue. In 1881 a troupe of eleven Fuegians, consisting of four men, four women, and three young children, of the Alaculoof tribe from Dawson Island,¹ visited Europe, and were examined by several distinguished anthropologists, amongst whom may be mentioned Professor Topinard and Dr. Manouvrier in Paris, and Professor Virchow in Berlin, who have carefully recorded their characters. The general appearance of these people confirms the account of Captain Fitzroy regarding them. Manouvrier and Virchow give a series of careful measurements of their heads and bodies, which are very valuable, being the most exact and extended series we possess of any of the Fuegians. With the ample directions given to travellers by the British Association and the Anthropological Societies of Paris and Berlin, for making observations on the living subject, it is earnestly to be hoped that Europeans now living in or visiting Fuegia, will obtain similar and more extended information regarding all the tribes of that country at an early date, before, if possible, the influences of civilisation have materially altered them for better or worse.

We have now to consider the physical characteristics of the Fuegians as illustrated by their osteology. The material at our disposal is even now extremely limited, and until it is considerably increased it will not be possible to arrive at accurate conclusions regarding them. The Museum of the Royal College of Surgeons of England contains eleven skulls and incomplete skeletons of four or five of the individuals to whom the skulls belonged. Seven of the skulls were presented by the Rev. Thomas Bridges; four skulls were brought home by the "Challenger" Expedition, and are in Professor Turner's possession in the University of Edinburgh; two crania are preserved in the Anthropological Cabinet of the Museum d'Histoire Naturelle at the Jardin des Plantes in Paris, under the charge of Professors Quatrefages and Hamy, making altogether a series of sixteen. Two of the skulls in the Museum of the College of Surgeons are those of young

¹ This family was said to come from Hermite Island, but Mr. Bridges, who saw them and conversed with them on their return, writes contradicting this statement, and states that they are Alaculoofs from Dawson Island. ("South American Missionary Magazine," November, 1882, p. 254.)

persons, and consequently cannot be included in the series from which measurements are taken, so that the number of specimens at our disposal for studying the characters of the skull is fourteen. Of the remaining parts of the skeleton there are no examples except those in the College of Surgeons, which are quite inadequate to determine with any degree of certainty its general characters. The series of adult skulls in the College of Surgeons' Museum is now on the table before you, and is composed of seven males and two females. Six of the former and both of the latter belong to the Yahgan tribe, having been obtained directly or indirectly through the South American Missionary Society; and the other male skull, with part of the skeleton, was brought home and presented by Captain Fitzroy, but does not bear any record of where it was found. The skulls brought home by the "Challenger" were obtained at the Settlement at Punta Arenas (Sandy Point), in the Straits of Magellan, but there appears to be no record to what tribe they belong; two of these are males and two females. One of the two skulls in Paris was also obtained from Punta Arenas, and the other from the Harbour of Mercy near Cape Pillar, on Desolation Island, and is therefore probably that of an Alaculoo; both these skulls are those of males. I have been careful to determine the exact localities from which the various skulls were procured, and to which tribes they belong, as it may be necessary when additional material is obtained, particularly of the Ona tribe, to study them separately from the rest, seeing they appear to be different in their appearance and perhaps also in their origin from the other tribes.

Stature.—Mr. Bridges states the average height of the Yaghan men to be 5 feet $3\frac{1}{2}$ inches, or 1,612 mm., and the women 5 feet 1 inch, or 1,550 mm.¹ And Captain Fitzroy states the men to be from 4 feet 10 inches to 5 feet 6 inches, or from 1,473 to 1,676 mm., and the women as "4 feet and some inches." None of the skeletons was complete enough to articulate, so that the only way we can estimate their height is from the long bones. This may be done from the femur alone, but better from the combined lengths of the femur and tibia, as when estimated in this way the risk of error is reduced to the minimum. Topinard's researches show that the length of the femur plus that of the tibia is to the height of the body in seventy-five Europeans whom he measured as 49.4 to 100, and in five South Americans as 49.5 to 100 in males, and as 49.5 and 48.2 to 100 in twenty-five European and six South American females respectively.² Presuming the same proportions to exist in Fuegians as in other

¹ "South American Missionary Magazine," January, 1882, p. 12.

² "Elements d'Anthropologie Générale" (Paris), 1882, p. 1041.

South Americans, I find that the average height of the male Yahgans, calculated from the skeletons, is 1,527 mm., or 5 feet 1 inch. This result has been arrived at by finding the average length of the femur and tibia respectively, adding those averages together, and then estimating the stature according to the canon of proportion given by Topinard for South Americans. The estimated height so obtained is almost exactly the same as that indicated by an average deduced from the limbs of the five individuals taken separately. The tallest is 1,600 mm. = 5 feet 3 inches, the skeleton brought home by Captain Fitzroy, and the shortest is 1,450 mm. (= 4 feet 9 inches). The stature of the two Yahgan women of whom we have the limb-bones is 1,423 or 1,420 mm. respectively (= 4 feet 8 inches), as estimated from the canon of proportion given by Topinard for that sex in South Americans. Probably the proportion which obtains in other South Americans is too high for the Yahgans, as all accounts agree as to their bodies being remarkably large in proportion to their lower extremities, and Professor Virchow states regarding the Alaculoofs he examined that this proportion "*liegt nicht bloß in der Muskulatur, sondern auch in dem Knochenbau.*"¹ This is supported by the average height of the people given by Mr. Bridges, being above that indicated by the limb-bones. This question cannot, however, be settled until we possess some complete skeletons.

The average stature of the Alaculoofs who visited Europe in 1881 is given by Dr. Manouvrier² as 1,612 mm. (= 5 feet 3½ inches) for the males, and 1,516 mm. (= 4 feet 11·8 inches) for the females, the tallest man being, according to Professor Virchow, 1,645 mm., the shortest 1,595 mm. Dr. Cunningham,³ naturalist to the "Nassau" Expedition, when in Sholl Bay measured two men and two women, presumably from his description belonging to this tribe, and found the males to be 5 feet 6 inches and 5 feet 3 inches respectively = 1,676 and 1,600 mm. respectively. Herr Böhr⁴ measured four men who came on board his ship at about thirty miles west of Cape Froward, and found them to average 1·52 m. (= 5 feet), the tallest being 1·55 m. (= 5 feet 1 inch), and the smallest 1·47 m. (= 4 feet 10 inches). The exact tribe to which they belonged is uncertain, but the position in which, according to Captain Fitzroy, they were found would indicate them to be Pecherays, or possibly a branch of the Alaculoofs.

As to the height of the Onas I have been unable to obtain any

¹ "Zeitsch. f. Ethnologie," Bd. xiii (1881), S. (379).

² "Bull. de la Société d'Anthropologie," 3^e Série, t. iv, p. 772.

³ "Nat. Hist. of the Straits of Magellan" (Edin., 1871), p. 320.

⁴ "Zeitsch. f. Ethnologie," Bd. xxii (1881), S. (30).

definite information except the general statement that they are taller than any other of the tribes.¹

The Skull.—A casual examination of the series of skulls before us will at once show to a practised eye that, although individual differences can readily be detected, it is composed of specimens possessing a great similarity in form and appearance, with one exception, namely, that numbered 1027, which is slightly different from the others. The male skulls are somewhat long, narrow, and high, with a well-marked median ridge, from which the sides of the cranial vault slope downwards and outwards like the roof of a house; the forehead is narrow, and recedes from a prominent glabella and from well-marked superciliary arches and external orbital processes; the orbits are round and open; the nasal portion of the face is narrow in proportion to its length; the width between the orbits is small; the portion of the maxilla between the nasal aperture and the alveolar border is deep in some instances and moderately prominent in all; the malar bones are well developed and angular, so as to give an appearance of breadth and flatness to the face; the chin is of medium size and fairly vertical. The two female crania are rounder in form than the males, the surface ridges less pronounced, and the facial portion, which is perfect in only one of the specimens, is proportionally shorter from above downwards. The nose is broader and the lower edges of the malars are less everted, the bones themselves being not so deep from above downwards; otherwise, the same typical features of the male skulls are observable in the female.

The maximum length of the cranium averages in the seven male skulls 188.4 mm., the largest being 194 mm., and the shortest 182 mm.; the maximum breadth averages 140.8 mm., the broadest being 143 mm., and the narrowest 137 mm. The maximum length of the two female averages 174 mm., and the maximum breadth 139.5 mm. These dimensions give the males an average cephalic index of 5.0, and the women of 79.8, which places both sexes in the mesaticephalic group. The average cephalic index of the two males in Paris is 74.87, and of the two brought home by the "Challenger" 75.2, that of the two "Challenger" females 78. The average cephalic index of the Alaculoofts who visited Europe is given by Manouvrier as 79.97 in the males, and 80.2 in the females.

The cephalic index of a skull found near Phillip Bay, presumably that of an Ona, brought home by Dr. Cunningham, is given by Professor Huxley as 78.²

¹ A statement was made in the discussion on Dr. Manouvrier's paper referred to in the Société d'Anthropologie of Paris, that the average height of the Onas is 1,800 mm., but I have not been able to verify its accuracy.

² "Journ. Anat. and Physiol.," vol. ii, p. 268. I have been unable to discover where this skull is preserved.

The vertical height of the male skull No. 1027 shows a marked deviation from that of the others of the same sex. An examination of its base indicates the cause of this to be the presence of a certain degree of platybasic deformity. It has therefore been excluded in calculating the average height and the indices in which height is a factor. The average height of the other sex is 140.5 mm., which, compared to the maximum length, gives an average length-height or vertical index, of 74.6; that of the "Challenger" skulls (male) is 74.5, and of the two in Paris 76.4. The height of the four females averages together 131 mm., and the vertical index is 74.0. Both sexes are therefore metriocephalic.¹ The vertical index does not exceed the cephalic index except in the Paris skulls. Comparing the height to the maximum breadth (the latter taken as 100) the male skulls have an average index of 92.3, those of the "Challenger" of 99.3, and those in Paris of 102.1. In the four females it is 93.9. In two of the six male skulls and in one of the "Challenger" skulls the height exceeds the breadth, in one instance both measurements are equal, and in the remainder the breadth is greater than the height. Generally speaking, however, it may be said that in the males the breadth and height are nearly equal; but in each of the four females, on the other hand, the breadth considerably exceeds the height.

The horizontal circumference of the males averages 518.5 mm. and of the females 491.5 mm. These figures would indicate the skulls before us to be smaller than those in Paris and Edinburgh. But Quatrefages and Turner, instead of measuring the horizontal circumference of the skull immediately above the glabella and superciliary ridges, include those prominences, a method not usually adopted by anatomists in this country, France, or Germany. Measured over these prominences the circumference of the skulls before us is 525 mm. in the males and 496 mm. in the females, which is the same as the measurement of the "Challenger" skulls. The pre- and post-auricular arcs are very uniform throughout the series except in 1027, where the post-auricular arc shows a considerable diminution in size as compared to that of the others. All the circumferences of this skull are smaller than the corresponding ones of the others.

The capacity of the male skulls, excluding that of No. 1027, is 1,452 cc., calculated by means of a slight modification of Broca's method, whereby the actual capacity is, I believe, as nearly as possible obtained. The average of the two females is 1,245 cc., or 207 cc. less than the males. The capacity of No. 1027 is lower than that of either of the females, being only 1,210 cc.,

¹ Zoology of the Voyage of the "Challenger," Part XXIX. "Report on Human Skeletons," p. 5.

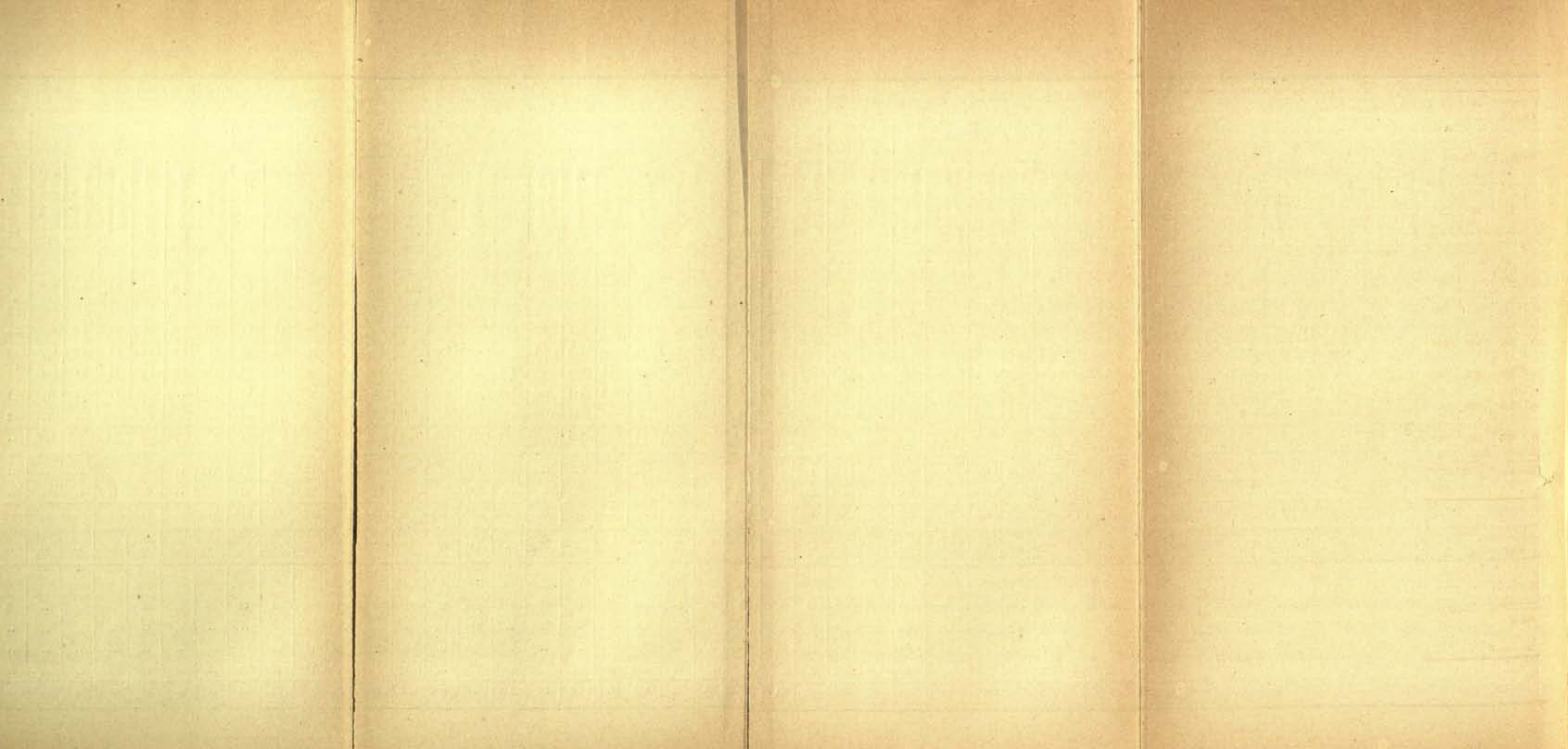
and being so different from that of the males I have thought it better to exclude it in calculating the averages. The capacity of the male skulls in Edinburgh, calculated by a method which, in his hands, Professor Turner considers "may be taken as furnishing in each case a close approximation to the actual capacity," averages 1,376 cc. in the males, and is 1,190 and 1,392 cc. in the females. Quatrefages and Hamy give the average capacity of the two males in Paris (calculated by Broca's method) as 1,680 cc., which far exceeds the size of the encephalon of any Fuegian skull in this country, after allowing for the excess of actual capacity given by Broca's method. The capacity of the encephalon places the males in the mesaticcephalic group of Topinard.¹ The probable weight of the brain, calculated by Dr. Manouvrier's formula,² is 1,265 grammes. The general form of the male cranium is an oval, somewhat narrower in front than behind, with feebly marked parietal eminences. The points of maximum breadth are situated near the middle of the skull, about 1-2 cm. behind the auriculo-bregmatic line, and in all cases low down in the parietal region or on the squamosals. The cranial vault is somewhat flattened on each side between the sagittal suture and the parietal eminences, giving what Cleland has termed an "ill-filled" appearance to this region.

The frontal region slopes gradually backwards and upwards towards the bregma, the slope of the forehead being increased in appearance, owing to the prominence of the glabellar region. The frontal bone is narrow in the region of the minimum frontal diameter, the temporal crests are well marked, and the posterior inferior angles project rapidly outwards and backwards. The prominent glabella already noticed is continued on each side into the superciliary ridges, which are also well marked, but not extended far outwards, their external limits corresponding with the external margin of the supra-orbital notch or foramen, as the case may be. Externally, beyond the superciliary ridges there is a concave depression, which is succeeded by large and strongly developed external orbital processes. Above, the glabella and superciliary ridges terminate suddenly, so as to form a well-marked line of demarcation between the cerebral and sub-cerebral portions of the bone. The obeliac region has a regular curve in some instances, but in others it is flattened and the fall of the back part of the head is more sudden. The variations in this region are well illustrated by the glabello-obeliac diameter, while the prominence of the glabella is shown by comparing the maximum length with the ophryo-occipital length, this latter being the distance between the point of maximum length on the

¹ "Elements d'Anthropologie Générale," p. 610.

² *Loc. cit.*, p. 610.

FUEGIANS.		CRANIAL MEASUREMENTS.																	FACIAL MEASUREMENTS.																	INDICES OF THE SKULL.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		DIAMETERS OF CRANIUM.											CIRCUMFERENCES.						HEIGHT.				TRANSVERSE DIAMETERS.						ORBIT.		NOSE.		PALATO-MAXILLARY.		MANDIBLE.					Curve of nasal bones.	Size of nasal spine.	Length-breadth.	Length-height.	Breadth-height.	Gonathic.	Facial (Kollmann).	Mid-facial (Kollmann).	Naso-malar (Thomas).	Orbital.	Nasal.	Palato-maxillary (Flower).	Fronto-zygomatic.	Gonio-zygomatic.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Maximum Glabella-occipital.	Glabello-obellae.	Ophryo-occipital.	Maximum transverse.	Maximum frontal.	Minimum frontal.	Bi-auricular.	Bi-astoric.	Vertical (Basio-bregmatic).	Basio-mid-frontal.	Basio-nasal.	Length of foramen magnum.	Fronto-occipital arc.	Total median circumference.	Auriculo-bregmatic arc.	Total transverse vertical circumference.	Total horizontal circumference.	Pre-auricular arc.	Capacity.	Basio-alveolar length.	Facial.	Alveolo-nasal.	Alveolo-orbital.	Malar.	External Bi-orbital.	Internal Bi-orbital.	Malo-naso-malar.	Maximum Bi-maxillary.	Bi-jugal.	Bi-zygomatic.	Inter-orbital.	Breadth.	Height.	Length.	Breadth.	Length.	Breadth.	Bi-condylar width.															Bi-goniac width.	Condylar height.	Breadth of ascending ramus.	Symphysial angle.	Mandibular angle.	Wear of teeth.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
No.		194	182	188	142 s	116	98	131	112	137	129	108	35	380	523	302	445	524	233	1,480	108	129	80	46	25	112	103	110	101	124	143	25	44	38	52	27	58	66	119	105	62	36	65°	123°	3	3	1	73.2	70.6	96.5	100	90.2	55.9	94.5	86.4	51.9	113.8	81.1	73.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
"	1025 B	..	186	173	181	143 p	120	93	133	111	141	129	102	35	382	519	302	448	515	235	1,453	99	122	76	44	29	107	99	105	103	123	146	22	30	37	53	25	57	66	120	106	51	32	70°	118°	2	1	3	76.9	75.8	98.6	97.1	83.6	52.6	94.3	94.9	47.2	115.8	82.2	72.6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
"	1025 C	..	192	178	185	142 s	115	91	130	109	144	134	105	34	398	537	310	449	521	232	1,468	102	117	71	44	26	107	99	107	99	120	144	24	39	34	54	26	59	66	131	104	58	36	58°	120°	3	3	2	74	75	101.4	97.1	81.2	49.3	92.5	87.2	48.1	111.9	79.2	72.2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
"	1025 D	..	182	169	176	141 p	120	94	129	108	138	129	98	34	376	508	297	438	507	227	1,354	98	126	75	47	27	108	98	102	101	119	140	21	39	35	52	23	58	65	126	101	65	32	56°	126°	3	3	1	77.5	75.8	97.9	100	90	53.6	96	89.7	44.2	112	85.7	72.1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
"	1025 F	..	194	171	190	142 p	119	91	127	112	144	133	100	39	396	535	315	450	526	238	1,527	95	116	69	40	24	103	93	98	99	118	143	15	42	38	50	22	51	62	118	107	59	34	61°	134°	2	1	2	73.2	74.2	101.4	95	81.1	48.5	94.9	90.5	44	121.5	83.2	74.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
"	1025	..	189	164	186	139 s	113	95	134	113	239	133	107	40	366	512	289	437	518	230	1,430	107	..	75	44	24	108	103	110	103	122	146	23	42	38	51	22	60	67	1	1	2	73.5	73.5	100	100	..	51.4	93.6	90.5	43.1	111.7	77.4	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
"	1027	..	182	165	176	137 s	113	92	128	109	*124	*121	100	*31	*358	*487	*280	*421	*497	235	*1,210	105	..	73	45	29	105	97	103	104	121	140	22	38	32	50	22	..	65	1	3	2	75.3	*68.1	*90.5	105	..	52.1	94.1	*84.2	44	..	80.7	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Average		..	188.4	171.7	184	141	116.6	93.4	130.8	110.6	140.5	131.2	102.7	36.1	383	522.3	302.5	444.5	518.5	232.8	1,452	102	122	74.1	44.3	26.3	107.1	98.9	105	101.4	121	143.1	21.7	40.4	36.1	51.7	23	57.2	65.3	122.8	104.6	59	34	62°	124°	74.8	74.2	99.3	99.2	85.2	51.9	94.3	89.9	46.1	114.4	81.5	73																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
"Challenger" Skulls		A	182	..	179	141 s	112	102	..	113	137	..	106	38	365	509	302	..	*520	..	1,390	104	..	66	143	..	39	34	52	22	58	63</



MEASUREMENTS OF THE SHOULDER GIRDLE AND BONES OF THE UPPER EXTREMITY.								MEASUREMENTS OF THE PELVIS.							MEASUREMENTS OF THE BONES OF THE LOWER EXTREMITY.							ESTIMATED STATURE.		
SEX.	SCAPULA.				Scapular Index.	CLAVICLE.		MALES.	Pelvis B.	F. "	H ₁ . "	H ₂ . "	Average.	Average Indices.	SEX.	FEMUR.		TIBIA.		FIBULA.			Combined length of Femur and Tibia.	
	Breadth.		Length.			R.	L.									R.	L.	R.	L.	R.	L.			
	R. 213	L.	R.	L.																				R.
MALES.	102	102	155	155	65·8	154	148	Sacral breadth ..	102	110	117	120	112·2	92·5	MALES.	—	427	—	365	—	351	792	1,600	
	96	95	144	143	66·5	152	140	Sacral length ..	95	92	116	110	103·2	93·4		1025 ..	—	428	—	340	—	330	768	1,551
	97	98	156	155	62·7	146	—	Ant.-sup. iliac spine width ..	230	234	243	227	233·5	192·5		1025 B ..	—	428	—	340	—	330	768	1,551
	102	—	168	—	60·7	—	—	Inter-crest width (external) ..	280	266	278	268	273	225·6		1025 F ..	402	405	343	337	330	325	743	1,501
Average	98·8		153·8		64·3	148		Pelvic height ..	212	197	215	212	209	172·8	1025 H ₁ ..	392	393	326	324	322	317	718	1,450	
FEMALES.	94	94	142	142	66·2	—	—	Iliac breadth ..	154	148	158	149	152·2	125·6	1025 H ₂ ..	413	417	350	348	338	—	764	1,543	
	HUMERUS.		RADIUS.		ULNA.		Posterior inter-iliac width ..	90	80	71	70	77·8	64	1025 H ..	—	—	366	365	359	345	—	—		
MALES.	291	285	236	251	250	266	Acetabulo-symphesial width ..	116	108	118	116	114·5	94·2	Average..	409·6		346·4		335·2		756	1,527		
	288	284	234	229	—	255	Pubo-ischeal depth ..	101	95	106	97	99·8	82	FEMALES.	1025 E ..	377	375	307	310	300	—	685	1,420	
	299	295	—	265	—	240	Antero-posterior diameter of brim ..	92	91	106	103	98	80·7											
	322	300	—	228	—	243	Transverse diameter of brim ..	125	123	123	115	121·5	100											
	298	292	—	—	—	—	Antero-posterior diameter of outlet ..	113	111	124	115	115·8	95											
Average	295·4		240·5		251·5		Transverse diameter of outlet ..	89	93	97	74	88·2	72·6											
FEMALES.	277	271	227	—	243	—	Subpubic angle ..	56°	70°	58°	59°	52°	—	Average..	376·0		312·5		—		688 5	1,432		

NOTES ON MEASUREMENTS.

The measurements of the skull and other parts of the skeleton are made according to the directions given in Topinard's "Elements d'Anthropologie Générale," with the following exceptions:—

Maximum frontal breadth. Quatrefage and Hamy, in "Crania Ethnica."

Bi-auricular breadth. Do. do. do.

Basio-alveolar length (Flower), from the basion to the alveolar point.

Palato-maxillary length and breadth. Flower, "Journ. Anthropol. Inst.," 1880

Height of face (Kollmann), from the nasion to the symphesial point of the mandible. The facial index is calculated from this height compared to the bi-zygomatic breadth, this latter being taken at 100; and the mid-facial index from the nasio-alveolar height compared to the same standard.

Orbito-alveolar height. Quatrefage and Hamy, "Crania Ethnica."

Malo-naso-malar length. Thomas, "Journ. Anthropol. Inst.," 1885.

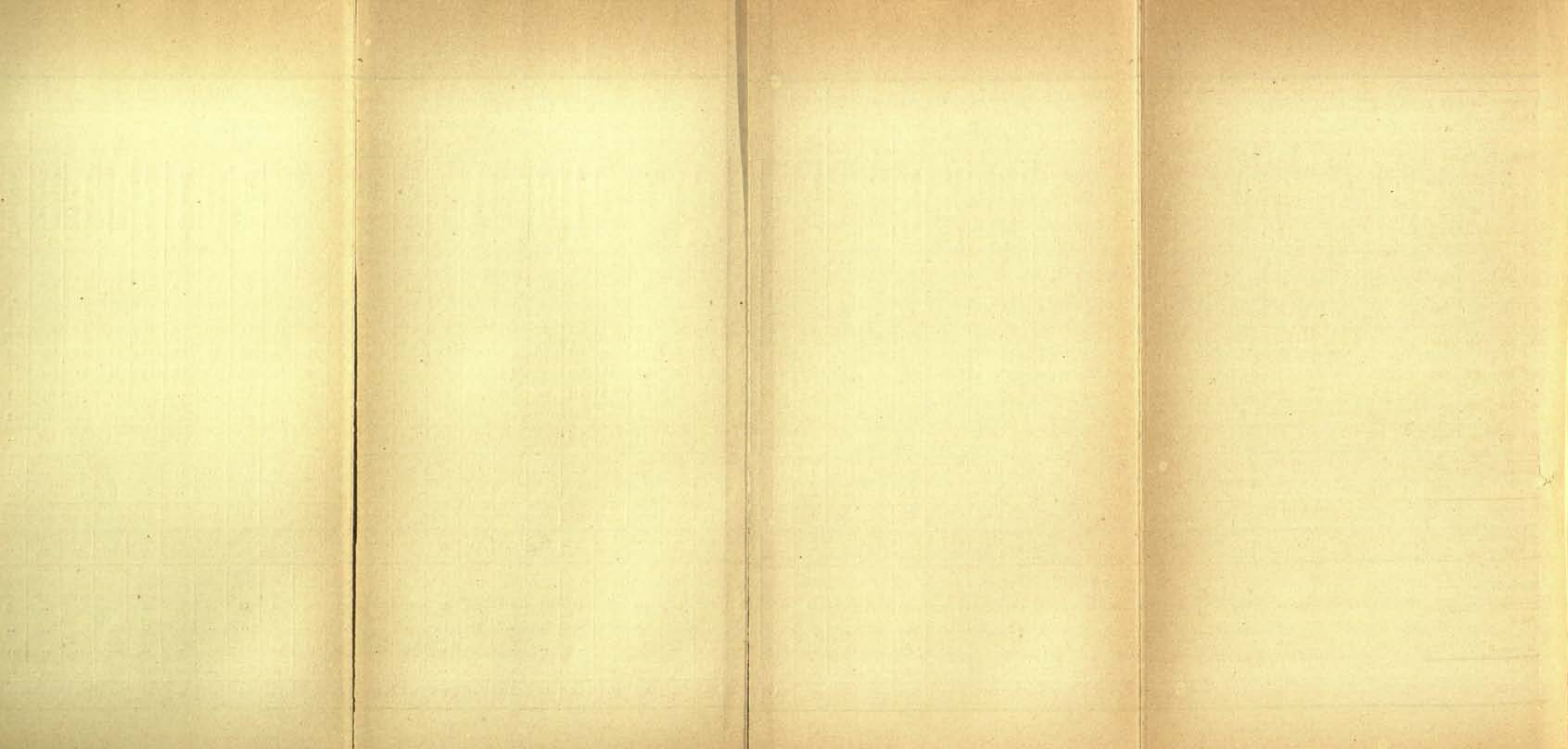
Broca's outlines have been used to indicate the curve of the nasal bones and size of nasal spine, and his numbers for the wear of the teeth.

For definition of pelvic measurements, see my paper on Pelvimetry in the "Journal of Anatomy," 1881-2.

p and *s* after the maximum breadth indicates whether it is situated on the parietal or squamosal bones.

An asterisk * before a measurement or index denotes that owing to some peculiarity of the parts, it has been considered advisable to exclude it in calculating the average.

† Method of making the measurement somewhat different to that adopted by author.



occiput and the point called by Topinard "le point inter-sourcilier" on the frontal. In No. 1025 F the upper part of the occipital is separated from the lower by a transverse suture, and forms a large simple epactal bone. A *torus occipitalis transversus* is frequently present, and developed more strongly in some specimens than in others. The sutures are in most instances obliterated, or nearly so, but when present they are simple. Wormian bones are either absent altogether or of very small size. In no case, as far as I am able to trace from the obliteration of the sutures, does the squamosal articulate with the frontal, or is there an epipteris bone present. The cranial bones are thick and massive, which makes the skulls weigh heavy. The mastoid processes are comparatively small, and in one instance (1025 C) paramastoid processes are developed. The basi-occipital length varies 5 mm. above and below the average, which is 102.7 mm. in the males and 101 mm. in the females. In the "Challenger" skulls it is 106 mm. in both males, and 101 mm. in the females. In the Paris specimens it is 108 mm. The foramen magnum is of moderate size as a rule, but in one instance is exceptionally large.

The skeleton of the face is extremely uniform in appearance in the males. The orbits are large and round, the orbital index averaging 89.9, which places the skulls as regards their orbits in the megaseme class. The inter-orbital width, though narrow generally, averaging 24 mm., is exceedingly narrow in one instance, where it measures only 16 mm. The projection of the bridge of the nose beyond the plane of the external borders of the orbits may be estimated by measuring the angle which the lines joining those points make with each other, as is done in Professor Flower's nasi-malar angle, or by estimating the relation the length of a line drawn from the inner margin of one fronto-jugal suture to the other, bears to another line passing over the bridge of the nose at its least prominent point, as proposed recently by Mr. Thomas.¹ The nasi-malar angle averages 145°, and the index 106°. The most accurate results appear to be given by the index. The nasal bones are narrow above and wider considerably below; their curve, as seen in profile, corresponds to Nos. 1 or 3 of Broca's outlines. At their upper ends, in some instances, the nasal bones project slightly outwards to meet the nasal process of the frontal, as we usually find occurs in skulls where the glabella is prominent. The nasal index averages 46.07, which shows the form of the nose to be leptorhine.

The degree of development of the nasal spine varies considerably, but in most cases it is represented by No. 2 of Broca's

¹ "Journ. Anthropol. Inst." (1885), p. 332.

outlines. The lower edge of the nasal aperture is sharp and well defined. The anterior surface of the maxilla in the region of the infra-orbital foramen is generally flat, and sometimes even concave. This is owing to the processus jugalis projecting rapidly outwards, and gives a squareness to this part of the face. The notch on the under surface of the process is feebly marked, but the process itself is deep from above downwards. The depth of the maxillæ between the floor of the nose and the alveolar border is variable, but on an average moderately deep, being about 23 mm.

The malar is fairly large and massive, and the tubercle on its anterior surface is large and well marked. From the jugal point the bone bends rapidly backwards and outwards, forming the zygomatic arches, which are also fairly massive. The processus frontalis is broad and flat, with the tubercle on its outer and upper margin strongly developed. This increases the width and squareness of the face superiorly.

The palato-maxillary index (taken according to Flower's method) is 114.4, or very nearly the same as in English skulls, where it is 117. The Fuegian is therefore intermediate between the very brachystaphyline Eskimo with a palatal index of 124 and the extremely leptospaphyline Australian and Tasmanian.¹ The alveolar borders posteriorly are nearly parallel, and then somewhat rapidly curve round to the median line. This gives a more or less broad appearance to the upper jaw when viewed from the front. The arch of the palate is moderately high.

In most specimens a number of the teeth have fallen out and been lost. Those that are present are of moderate size, but often much worn down; no trace of caries is to be detected in any of them, nor is there any abnormality with respect to number.

Five of the crania have mandibles attached to them. In three of these the chin is narrow and fine, but in the other two it is rounder. When the skulls are placed with the condylo-alveolar plane horizontal the anterior surface of the symphyses projects little, if anything, beyond the alveolar border of the maxillæ, except in one instance. The mandibular angle varies very considerably in size; this is apparently not entirely dependent upon age, but also upon individual peculiarities. In four instances the bone is well developed, but in the fifth it is more slender.

Considering the face as a whole, we find that the facial index obtained from the height of face between the nasion and the inferior border of the chin, compared with the bizygomatic

¹ "Journ. Anthropol. Inst." (1880), p. 161.

breadth (this latter = 100), is 85.2, which places them in the brachyprosopic group (below 90) and the mid-facial index, or the relation of the portion of the face between the nasion and alveolar point to the bizygomatic width, is 51.91, which places them just within the dolicho- or lepto-prosopic group (above 50.1); making three groups of this index and the previous one, as we do of the other indices, the Fuegians would be mesoprosopic in respect to both indices. Topinard has pointed out the importance of studying the anterior and posterior lines of facial contour. The anterior contour is indicated by comparing the external biorbital and bimandibular diameters with that of the bijugal, this latter being taken as 100. The posterior contour is shown by ascertaining the relations which the bistephanic or maximum frontal and bigoniac diameters bear to the bizygomatic width, this being taken as 100. The following table shows the relations of these parts:—

	Fuegians.	Parisians.	New Caledonians.	Eskimo.
ANTERIOR CONTOUR—				
External biorbital diameter ..	88.5	92.5	91.3	85.5
Bijugal " ..	100.0	100.0	100.0	100.0
Bimaxillary " ..	80.8	78.8	97.8	94.1
POSTERIOR CONTOUR—				
Maximum frontal diameter ..	81.5	90.7	77.2	75.7
Bizygomatic diameter ..	100.0	100.0	100.0	100.0
Bigoniac diameter ..	73.0	75.2	74.4	81.4

Side by side with the contours of the face of the Fuegians I have placed those of Parisians, New Caledonians, and Eskimo as given by Topinard. From the preceding table we see that the frontal region is broader in the Europeans than in the Fuegians in both contours. The Fuegians are on an average phenozygos, the fronto-zygomatic index being under 90, which, in a previous communication, I have shown to be the limits between phenozygosity and cryptozygosity. The bimaxillary index being greater in the Fuegians than in the Europeans shows the mandible to be rounder, or rather less V-shaped than in the latter.

In profile the face outline is regular and moderately prominent, the gnathic index being 99.3, which places them in the mesognathous group. The facial angle formed by a line extending from one auditory meatus to the other over the alveolar point, and a second from the ophryon to the alveolar point measured with Broca's facial goniometer, is 67°. The angle is exactly the same when the nasion is substituted for the ophryon.

There is no marked alveolar or dentary prognathism. Topinard has placed in his tables of essential measurements the length from the maximum occipital point to the base of the naval spine, also another from the same starting point to the alveolar point. The average length of these lines is, the occipito-spinal 199·6 mm. and the occipito-alveolar 205·7 mm. in the male Fuegian skulls. These lines doubtless give the profile of the face, but not better than the gnathic index and a spinal index formed in the same way if it is necessary to show the difference in degree of prognathism of the two points.

The cranial characters of the Yahgans may be briefly stated as mesaticephalic, metriocephalic, megacephalic, megaseme, leptorhine, mesostaphyline, platopic, mesoprosopic, and mesognathous.

The characters of the vertebral column and thorax could not be studied, as unfortunately on the passage home the sacks in which the bones were packed became rotten and the various portions of the skeletons were mixed and several of the vertebræ lost, so that it was impossible to separate them and assign them to any particular skull, or indeed to make any use of them. Hence we have been obliged to study the pelvis and limbs separately from the skulls.

The pelvic index in four males averages 80·7, which is almost the same as in European males (80). The maximum external breadth from crest to crest of the ilium compared to the height of the pelvis, or rather of the innominate bone, measured from the ischium to the highest point of the iliac crest (this length being taken as 100), gives an index of 130·6, as compared with 126·6 in Europeans.¹

The average length of ten humeri of males is 295·5 mm., of radii 240·5 mm., and of six ulnæ 251·9 mm. The humero-radial or antibrachial index of these is 81·3, which is very high, and shows that the two segments of the arm bear nearly the same proportion to one another in the Fuegians that they do in the Andamanese, where the index is 81,² while in Europeans it is only 73·67. The length of the humerus and radius together averages 536 mm. In only one instance is there perforation of the supra-condylar fossa; no case of supra-condylar foramen or tubercle occurs.

The average length of the femur in five skeletons of males is 406 mm., and that of the tibia in the same skeletons and an additional pair is 344 mm. These measurements give a total length to the inferior extremity of 750 mm., and a femero-tibial

¹ "Journ. Anat. and Phys.," 1881-2.

² Flower, "Journ. Anthropol. Inst.," 1879, p. 128.

index of 84·7, which is again almost the same as Flower found in the Andamanese, viz., 84·5, and Topinard, in South Americans, 84·1, while in Europeans it is 81·1.

The intermembral index, or the relation of the length of femur and tibia (= 100) to the humerus and radius, is 71·4, while in Europeans it is 69·73; that of the proximal segments of the limbs, or the femero-humeral index (the femur = 100), is 72·6, the same as in Europeans. As the humerus bears the same proportion to the femur in Fuegians as it does in Europeans it follows that it is the forearm of the Fuegians, like that of the Negro, which is long in proportion to the humerus, and not the latter, which is short. The length of the forearm in proportion to the upper arm in the Fuegians is even greater than in the gorilla, in which the index is 80.

Conclusion.—The inhabitants of Tierra del Fuego, in common with the other native races of the great American continent, present strong affinities to the Mongolian race in the colour of their skin, the character of their hair, and the form of their face and features generally. Whether we are to regard the native races of America as Mongolians is an open question however, and beyond the scope of the present communication. Long isolation from the people of other parts of the continent has somewhat modified the character of the Fuegians, and they have developed characteristics which distinguish them from the other people of their own stock in those places which are the most distant from the mainland. This probably accounts for the circumstance that the skulls before us are similar in characters, while the Fuegians who visited Europe in 1881 were not of a homogeneous type.

Explanation of Plate VI.

Fig. 1 shows the *norma frontalis*, and

Fig. 2 the *norma lateralis* of an adult male Fuegian (Yahgan tribe). The figures represent the skull with the aveolcondylar plane horizontal, and are reduced from drawings made with Broca's stereograph.

DISCUSSION.

The Rev. R. J. SIMPSON expressed his pleasure at being present and finding that the contributions made by the Rev. Thos. Bridges, the chief of their Mission in Tierra del Fuego, to the cause of science had been so much valued and so handsomely acknowledged. In everything connected with that remarkable land the South American Missionary Society took a deep and lively interest. Its

Christian labours there in civilising and Christianising the aboriginal races had been not only remarkably successful, but had attracted the notice and admiration of European nations, such as France, Italy, and Germany, as well as astounded and pleased the late Mr. Darwin so much that he became a liberal donor to the Society's funds. The official notices of the English Admiralty also bear dry but eloquent testimony to the wondrous change in the dispositions and habits of the natives on the coast, who now seek to rescue and not to wreck, rifle, and massacre the poor mariners cast upon that stormy shore. The Rev. Thos. Bridges and his fellow missionaries had indeed achieved a noble work, and amongst the rest Mr. Bridges had studied the language of the Yaghans, drawing up a Dictionary and Grammar, and had translated into it the Gospels of St. John and St. Luke and the Acts of the Apostles. The Argentine Government, in whose territory the Mission is situated, had lately recognised in the strongest manner the blessings conferred by that Mission, and had not only confirmed its occupation but directed its officials to give it every help and to protect the natives in their persons and property, the first instance of the kind in South American history.

Captain E. POULDEN, R.N., Secretary to the South American Missionary Society, explained, by the aid of a map, that Chili and the Argentine Republic had now divided Tierra del Fuego between them, the latter having, so to speak, the toe of the main island from a north and south line from Cape San Diego, the east entrance of the Straits of Magellan, to a point just west of Ooshooia, the Society's Mission Station, about the centre of the Beagle Channel, and the Mission Station was therefore in Argentine territory, in which was also included Staten Island; whereas the Chilian portion included the whole of the coast-line of the Straits of Magellan, the western portion of the islands, and the islands south of the Beagle Channel, including Cape Horn. The Rev. Thos. Bridges, missionary at Ooshooia, had been working amongst the Yahgan tribe, almost wholly inhabiting the southern coasts and islands, though by means of Yahgan women dwelling with the Ona of the main island, who were foot Indians more allied to the Patagonians, he had been enabled to have some communication with these latter. Captain Poulden observed that the South American Mission had been the means of introducing cattle, of which there were some two hundred now in Tierra del Fuego, and recently some sheep. About half the cattle were owned by natives. The Society's farm island (Keppel), in the West Falklands, afforded the means for industrial farm training and schooling for some eighteen to twenty natives there, and considerable intelligence had been developed. The natives entered intelligently into such European games as rounders and prisoners' base. Spears of 10 to 12 feet length were used, armed with long, tapering, barbed bone heads. A full-sized Fuegian canoe, sent home by Mr. Bridges, which had been at the Fisheries, might be seen in the Naval Architecture Department of the South Kensington Museum.

He had understood from Mr. Bridges that the idea that cannibalism was practised by the Fuegians arose probably from casual visitors having observed human bones near the dwellings, which however had been no doubt disturbed by dogs and foxes from the heaps of mussel shells in which they were interred, the Indians in their savage state having no means of digging deep graves in the very hard earth. The Indians used a hard, heavy stone, which they call something equivalent to firestone, for striking fire, and a special deposit of this peculiar stone was to be found near the Magdalen Channel. In addition to fish, seals, and shell-fish, the Indians depended much on the fungi, which in twenty different sorts grew on the beeches. Captain Poulnden gave a condensed account of the South American Missionary Society, dealing with Carl Hagenbeck, the Hamburg importer of animals, in respect of the party of Fuegians brought to Europe and exhibited some little while since from Dawson Island, and said that a remnant of this party had ultimately reached the Mission Station, and that one little girl yet survived there.

Professor FLOWER and Professor THANE also took part in the discussion.

[Mr. HYDE CLARKE, who could not be present at the meeting, sent the following note:—

Dr. Garson has dealt with the skulls of the natives and their racial characters. I propose to communicate my observations on the brain, as indicated by the language; but language is not a test of race. How the race came to Tierra del Fuego is one question beyond history; how the language came there is another. The determination of each must be obtained from comparative data.

In the investigation is concerned something more than a local relation, namely, whether the language is a creation of the savages themselves or whether it has been imported.

For the Yaghan language we have good material in the Gospel of St. Luke, published by the Bible Society, having been translated in 1882 by the Rev. T. Bridges. Mr. Alexander J. Ellis, the President of the Philological Society, referred to this language in his Presidential Address for 1882. In the same year I read a paper on the subject before the British Association. Mr. Ellis's address included a copious paper by Mr. Bridges on the grammar of the language, which is of a very remarkable character. Appended to it is a letter in Yaghan, written by a native in the Mission House to Mr. Bridges.

Having extracted a large number of words from the Gospel, these were compared in every direction. But without going into details of a linguistic character, it is sufficient here to state that the relations enter into a definite group, No. VIII of Dr. Koelle's *Polyglotta Africana*, and have a notable resemblance to the Ngoten, Melon, and Ekamtulufu languages.

Of course there are resemblances to other languages all over the world, for this is to be observed of all languages, but it is a remark-

able circumstance that as to Yahgan a definite classification can be obtained, for this is very rare.

How such conformity can exist between Tierra del Fuego and West and South Africa others may explain. For my own part my conclusions have often been made public. The identification rests upon not less than eighty words, and further examination will produce more.]

APRIL 28TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

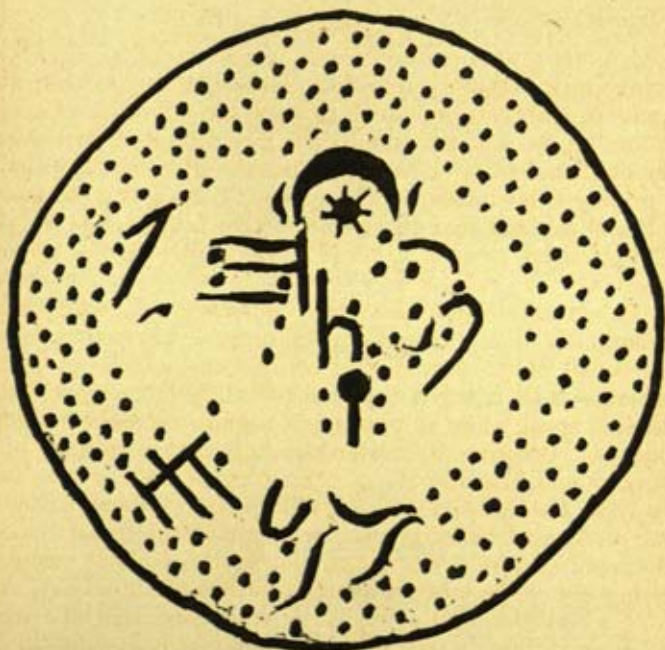
The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From the AUTHORS.—*Les Australiens du Musée du Nord.* By Dr. É. Houzé and Dr. Victor Jacques.
- From the BERLINER GESELLSCHAFT FÜR ANTHROPOLOGIE.—*Zeitschrift für Ethnologie.* 1884, Heft. 6; 1885, Heft. 1.
- From the SOCIETY.—*Proceedings of the Asiatic Society of Bengal.* December, 1884.
- *Journal of the Asiatic Society of Bengal.* Vol. LIII, Part I, Special Number.
- *Bulletins de la Société d'Anthropologie de Paris.* Tom. VIII, Fas. 1.
- *Journal of the Society of Arts.* Nos. 1691, 1692.
- From the EDITOR.—*The American Antiquarian.* Vol. VII, No. 2.
- “*Nature.*” No. 808.
- *Matériaux pour l'Histoire de l'Homme.* April, 1885.
- *Revue d'Anthropologie.* 1885, No. 2.
- “*Science.*” No. 114.

The following paper was read by the Director:—



THE KEKIP-SESOATORS, OR ANCIENT SACRIFICIAL STONE, OF THE
NORTH-WEST TRIBES.

A relic of the Mound-builders, found at Red-Deer River, Alberta District,
North-West Territory, May 10th, 1882, by Jean L'Heureux,
M.A., and presented by him, July 20th, 1882, to His
Excellency the MARQUIS OF LORNE, and
Her Royal Highness PRINCESS LOUISE.

The KEKIP-SESOATORS, or ANCIENT SACRIFICIAL STONE, of the NORTH-WEST TRIBES of CANADA. By JEAN L'HEUREUX, M.A., Government Interpreter, Blackfoot Indians.

[WITH PLATE VII.]

ETHNOLOGICAL studies, tradition, language, and architectural remains furnish data by which to trace the migration of ancient peoples. It is now an established fact, admitted by the most eminent ethnologists of America, that the Hue-hue Tlapalan, or the primitive habitation of the ancient Toltecs, was situated in the Far West, and that the whole of the Nahua tribes were one of the primitive races that peopled the north-west at a remote period.

It is not improbable that the Nahuas of old, while few in number, arrived at our north-western coast, where they found a home until they became a tribe of considerable proportion. Thousands of their newly explored tumuli in Oregon and British Columbia speak more of permanent sojourn than of a migratory residence. Crossing the watershed between the sources of the Columbia and Missouri rivers, a large portion of the tribe found its way to the Mississippi and Ohio valleys, where, under the name of Mound-building people, they laid the foundation of a widespread empire. The remainder of the Nahuas, instead of crossing the mountains, migrated southward into Utah, establishing a civilisation, the remains of which are seen all over the San Juan valley in the cliff-dwellers which abound in that region.

An ancient site of the western branch of the Mound-builders appears to have been the head-waters of Missouri river, whence they spread themselves north as far as the South Saskatchewan and its tributaries, establishing numerous colonies all along the eastern base of the mountains and away south to the head-waters of Rio Grande, by the south pass of the Rockies.

The scattered remains of Mound-builders' works in the north-west territory are connected by a similar chain of works at James river, in Northern Dakota, with the great artery of the Missouri mounds, and show more of a migratory movement than of a fixed residence.

The most important of these ancient relics of the past are principally found in the Alberta district, close to the international boundaries, amongst which the more northern works are the defence works of Blackfoot Crossing, the ruins at the Canantzi village, the Omecina pictured rocks, the graded mound of the third Napa on Bow river, the tumuli of Red-Deer river,

the walled city of the dead in the inland Lake of Big Sandy Hill on the South Saskatchewan, and the Sesoators or sacrificial stones of the country, to describe one of which is the object of the present paper.

The recorded traditions of the ancient civilised nations of the Pacific States corroborated to some extent the tradition of the Indian tribes of the north-west. The Kamuco of the Quiché mourn over a portion of their people whom they left in Northern Tullan. The Papol-Vuh, speaking of the cultus of the morning star amongst the ancient Toltecs or Nahuas, states that they were drawing blood from their own bodies and offering it to their stone god Tohil, whose worship they first receive when inhabiting the north. The Napas tradition says that, "In the third sun (Natose) of the age of the earth, in the days of the Bull of the Nile, the third Napa of the Chokitapia, or the plain people, when returning from the great river of the south, caused to be erected in the sacred land of the Napas (Alberta district), upon certain high hills of the country, seven sesoators or sacrificial stones for religious services amongst his people."

The religious idea in man, whether observed in the darkest heathenism or partially enlightened civilisation, has always associated a place of worship with condition of elevation and isolation. These high places of worship of the Napa's tradition were the ever-open sanctuaries of a migratory people, at whose shrines the worshipper was himself first victim and sacrifice in the rites, and point to the belief of an early age, not entirely forgotten by the remnant of the race whose remains of ancient works seem to sustain the claim of our Indian traditional lore.

A constant tradition of the Chokitapia or Blackfeet Indians, a powerful tribe of remote Nahua parentage, inhabiting at the present day the southern part of the north-west territory of the Dominion of Canada, has always pointed to a high hill situated on the south side of Red-Deer river, opposite to Hand Hill, two miles east of the Broken-knife ridge, as the site of one of those ancient cities of the bygone days of the primitive race.

Elevated 200 feet above the level of the surrounding plain, *Kekip-kip Sesoators*, "the hill of the Blood Sacrifice," stands like a huge pyramidal mound commanding an extensive view of both Red-Deer and Bow river valleys. A natural platform of about 100 feet crowns its lofty conical summit. At the north end of this platform, resting upon the soil, is the Sesoators, a rough boulder of fine grained quartzose rock, hemispherical in form, and hewn horizontally at the bottom, measuring 15 inches high and about 14 in diameter. Upon its surface is sculptured, half-an-inch deep, the crescent figure of the moon, with a shining

star over it. Two small concave basins about 2 inches in diameter are hollowed into the stone, one in the centre of the star-like figure, the other about 7 inches farther in a straight line with the star figure. Around them are traced strange hieroglyphic signs, bearing some likeness to the hieroglyphs of the Davenport tablet and the Copan altar. Interwoven all over are numerous small circlets, which remind one of the sacrificial stone of Mexico.

At times of great private or public necessity, when extraordinary blessings are much sought after, such as the successful return of a long-absent war expedition, the cure of inveterate disease, or the absence of game in the hunting grounds of the tribe, this Altar of the Temple of Nature is thronged by many devoted worshippers—the deputies of the family, the clan, the tribe, and in certain emergencies of the whole nation.

The sun is disappearing behind the snowy top of the mountains in the west, the shadow of night has already encompassed the Indian village in the eastern valley of the river. Behold! a voluntary victim, bearing in his hands the instrument of his own sacrifice, clothed in festive attire, is slowly ascending the well-smoothed path of the hill. Building the sacred fire on the top of the platform, he sits gazing wistfully in the far east for the coming of the Star-God of his ancestors. It is the vigil of the warrior hero. Lo! the first ray of the morning star lights the distant horizon, and the faithful watcher has fallen prostrate on the ground doing homage to the war god of the nation. Laying a finger of his left hand on the top of the stone, he cuts it off, leaving the blood to flow into the basin. Throwing the sacrificial knife on the ground he with his right hand seizes the severed finger and presents it still bleeding toward the morning star, crying, "Hail! O Episors, Lord of the Night, hail! Hear me, regard me from above. To thee I give of my blood, I give of my flesh. Glorious is thy coming, all-powerful in battle, son of the Sun, I worship Thee; hear my prayer. Grant me my petition, O Episors!" Putting the severed finger into the basin of the star-like figure, the devoted visitor to the shrine of the Napa of old retraces his stately steps toward the lake at the foot of the hill, where alone he stoically attends to the dressing of his self-inflicted wound. With the return of the sun in the east the messenger to the god enters his own village, where triumphant honours and a well-earned public ovation await him. Amongst the Blackfeet these self-inflicted wounds ranked equal to those received in the battle-field, and are always mentioned first in the public recital of the warriors' great deeds in the national feast of *Ocan*. It is the cross of the "legion d'honneur" of our red men.

Explanation of Plate VII.

Kekip-Sesoators, or Ancient Sacrificial Stone, of the North-West Tribes, a relic of the Mound-builders, found at Red-Deer River, Alberta District, North-West Territory, May 10th, 1882, by Jean L'Heureux, M.A., and described in the foregoing paper.

DISCUSSION.

Dr. JOHN RAE remarked that Mons. J. L'Heureux's interesting paper having drawn attention to the prairie Indians of North-West Canada, the President had kindly requested him to say a few words on the subject of the half-breeds. These, in consequence of certain disturbances caused by them, were at present attracting a good deal of notice. Dr. Rae said: "The name 'Half-breed'—not in any way looked upon as a term of reproach—is applied indiscriminately, and regardless of the proportionate admixture of blood on either side, to all those who are descendants of white and 'red' parents, or of any crosses of these. The original fathers are whites—a white woman seldom marrying a red man—chiefly from the Orkney Islands, the Hebrides, and French of Lower Canada, who formed the principal employés of the Hudson's Bay Company, and of another large fur Company with which the former amalgamated about sixty years ago. On the mothers' or Indian side the plain and 'swampy' Crees¹ (some of whom are good-looking) form a very large element. I may add that these two branches of Crees are far more numerous and widely spread over the northern parts of North America than any other tribe. These mixed races, whether from Canadian or north of Scotland fathers, are, I think, taller than either of the parent stocks, and do not seem to degenerate by intermarriage, except where they loaf about towns, &c., and drink poisonous whiskey. In the Hudson's Bay Company's service by whom they are much employed, and lead a healthy, sober life, they are vigorous and strong after passing through many generations. Although, perhaps, not so broad-shouldered as their fathers, they are deep-chested and have good lung capacity, and make admirable hunters and voyagers; some of them formed a not unimportant part of four of the Arctic Expeditions in which I was engaged. As they become old, both men and women, especially those with Scottish or Orkney blood, have a tendency to become corpulent. The two varieties (French and Scottish) do not, as a rule, mingle much with each other, and seldom intermarry. In fact, the one has much of the plodding and docile character of his male progenitor, whilst the other takes after his more volatile *Canadian-French* parent, and more readily adopts or falls back into Indian customs and habits. I do not think that there is a single English-speaking half-breed connected with the present

¹ The plain Crees live in the prairies; the "Swampies" in the thick woods.

so-called half-breed rebellion. Every one of these half-breeds had a certain number of acres of good land made over to them (how much I do not remember) by the Canadian Government, but in nearly all cases these lands were disposed of to certain *sharp* men at Winnipeg and elsewhere, for perhaps one-tenth of their value, and the *sharp* men made handsome fortunes, whilst the half-breeds migrated some hundreds of miles to the north-west, on the Saskatchewan River. It may be worthy of remark that the half-breed women are, not seldom, handsome in person and pretty in face, very neat-handed and admirable sempstresses. A number of the half-breed young men are apt and quick learners, and have taken fair positions at our Universities. One (an immensely large man named Norquay, descended from an Orkney man) is at present Premier of Manitoba. Another, also of the same parentage, named Inkster I think, is or was recently Mayor of Winnipeg."

The following paper was read by the author:—

On the PAST and PRESENT CONDITION of certain RUDE STONE MONUMENTS in WESTMORELAND. By A. L. LEWIS, F.C.A., M.A.I.

THE highest point of the railway between Lancaster and Carlisle is a little to the south of the village and station of Shap in Westmoreland, where there were formerly some very extensive rude stone monuments, now unfortunately almost entirely destroyed. Camden, writing in the middle of the sixteenth century, says of them: "Several huge stones of a pyramidal form, some of them 9 feet high and 4 feet thick, standing in a row for near a mile, at an equal distance, which seem to have been erected in memory of some transaction there which by length of time is lost." Dr. Stukeley, writing about the middle of the last century, says: "At the south side of the town of Shap we saw the beginning of a great Celtic avenue on a green common; this avenue is 70 feet broad, composed of very large stones set at equal intervals; it seems to be closed at this end, which is on an eminence and near a long flattish barrow with stone works upon it, hence it proceeds northward to the town, which intercepts the continuation of it and was the occasion of its ruin, for many of the stones are put under the foundations of walls and houses, being pushed by machines they call a 'betty,' or blown up with gunpowder; . . . houses and fields lie across the track of this avenue, and some of the houses lie in the enclosure; it ascends a hill, crosses the common road to Penrith, and so goes into the cornfields on the other side of the way westward, where some stones are left standing, one particu-

larly remarkable, called the 'Guggleby' stone. . . . I guess by the crebrity and number of the stones remaining there must have been 200 on a side" (he says the interval between the stones was 35 feet, which would give about 7,000 feet, or nearly a mile and a third, or allowing for the thickness of the stones themselves, a mile and a half, as the length of the avenue); "near them in several places are remains of circles to be seen of stones set on end, but there are no quantity of barrows about the place, which I wonder at." Gough, in his edition of Camden (1806), says: "At the south end of the village, on the common near the roadside, is an area upwards of half-a-mile long and between 20 and 30 yards broad, of small stones; and parallel to the road begins a double row of immense granites, 3 or 4 yards diameter, and 8, 10, or 12 yards asunder, crossed at the end by another row, all placed at some distance from each other. This alley extended within memory over a mile quite through the village, since removed to clear the ground; the space between the lines at the south-east end is 80 feet, but near Shap only 59, so that they probably met at last in a point. At the upper end is a circle of the like stones 18 feet diameter." Camden also mentioned an ebbing and flowing well, which Gough said was lost, and that its peculiarity was purely fortuitous; still it might have been used for the advantage of the priesthood who probably set up the stones. A circle is said to have been destroyed when the railway was made, six stones of which may still be seen from the train on the west side in passing from a cutting to an embankment about half-a-mile south from the station; they are all prostrate, and are from 6 to 9 feet long, 3 to 6 feet broad, and 2 to 3 feet high or thick; if they have not been moved the diameter of the circle (if circle there were) would seem to have been about 125 feet; another stone is built into a wall 30 feet north from them. Of the stones of the avenue, which was called the "Karl Lofts," three or four are lying in front of the police court, large fragments of others have been built into walls, and two are in the fields to the west of the village, one standing and another fallen ($8\frac{1}{2} \times 6 \times 4$ feet); there may be two or three others in some of the enclosures, but there is nothing to show the extent of the monument which once occupied so much space. From the descriptions already quoted it would seem that the avenue ran northerly or slightly north-westerly from the circle (if circle it were), part of which still remains by the railway, that its breadth was diminished as it went northward, that another row crossed it, and that there were smaller circles or other arrangements attached to it here and there. These peculiarities all have their counterparts in the great avenues of stones in Brittany, but, while those consist of several

more or less parallel lines, the "Karl Lofts" would seem to have been for the most part a simple avenue of two lines. It is not stated that any interments or other remains were found when this avenue was destroyed, and if there were none there would be another point of resemblance to the Breton alignments, which are not found to have been sepulchrally monumental. The direction in which the "Karl Lofts" ran is an unusual one, but it has also a counterpart in Brittany.

Several small circles and groups of standing stones are marked on the ordnance map as existing on the moors in the neighbourhood of Shap. I was only able to reach one of these groups, the most interesting parts of which were three small tumuli of three different patterns. One had only a central cist (4 feet \times $2\frac{1}{2}$ \times $2\frac{1}{2}$ deep), which had been rifled long ago and filled up with stones, probably to prevent the sheep from falling into it. Another had a line of three small stones like headstones, with a cist behind the middle one; in this respect it is not unlike a much larger tumulus and collection of stones at Gorwell, in Dorsetshire, described by me in the *Journal of this Institute* for November, 1881. The third tumulus had a circle, 16 feet in diameter inside, formed of small stones, each measuring about 3 feet each way; nine of these remain, and there is room for a tenth, unless, indeed, the gap, which faces south, were left as an entrance; there is a hole in the middle, where an interment has probably been made and long since destroyed.

The most interesting monument now remaining in the vicinity of Shap is not, however, marked on the ordnance map. It is situated at a place called Gunnerskeld, two or three miles north from Shap, and consists of two irregular, concentric, slightly oval rings, about 50 and 100 feet in diameter respectively, the longest diameters being from north to south. The inner ring is nearly perfect, and consists (besides fragments) of thirty large stones, all but one of which are prostrate; they are nearly contiguous, and seem more likely to have been the retaining wall of a tumulus than anything else, as the ground inside them is a foot or two higher than it is outside, and there are some small stones surrounding a sort of crater in the middle, which is suggestive of a destroyed interment. Eighteen stones of larger size remain of the outer ring, and of these three only remain upright, one at the south-south-west, and two at the north, which, in the present condition of the structure, look like a gateway; twelve more stones would be required to make this ring symmetrical in form as well as in number, and it is not unlikely that this monument, when complete, consisted of a cist and low tumulus, bounded by a rough retaining wall of large blocks, and surrounded, at a distance convenient for processional or other

ceremonies, by a ring of thirty larger stones, from 5 to 8 feet high when erect, and unusually bulky in proportion. A most careful and accurate plan and sketch of this structure were published by Mr. Dymond, C.E., F.S.A., in the "*Journal of the British Archæological Association*" for 1879, and I have therefore not thought it necessary to trouble you with minute details as to its measurements. I may add that Mr. Dymond, like myself, regards these stones as having formed a sepulchral monument, and as differing very much in character from the principal circles in Cumberland.

About a mile and a half south from Penrith, on the top of a slight eminence, is an oval enclosure called Mayburgh, about 100 yards in diameter from east to west, and 90 yards from north to south. It is formed by a bank of loose stones, 30 yards thick at the base, and about 16 feet higher than the ground inside; but there is no ditch. A stone, 10 feet high and 4 or 5 wide and thick, stands somewhat north-west of the centre of the enclosure, and, according to Gough, three others were so placed as to form a square with it, and four more stood at the corners of the entrance; but all these had long disappeared when he wrote in 1806. Dr. Stukeley, however, who visited the spot about the middle of the last century, says: "Within this fine plain, which is now ploughed up, have been two circles of huge stones, four remaining of the inner circle till a year or two ago, that they were blown to pieces with gunpowder. They were of a hard black kind of stone, like that of the altar at Stonehenge. One now remains, 10 feet high, 17 in circumference, of a good shapely kind; another lies along. This inner circle was 50 feet in diameter. One stone at least of the outer circle remains by the edge of the cairn, and two more lie at the entrance withinside, others without, and fragments all about." If Dr. Stukeley's statement be correct the single stone now standing is therefore the sole survivor of two concentric circles, surrounded like those at Avebury and Arbelow with a high bank, which prevented those within from seeing anything outside and those outside from seeing anything within.

Another resemblance, though of a different character, which these circles exhibit to those of Avebury is that both were destroyed about the same period, namely, that of George I. The advent of "the Illustrious House of Hanover and Protestant Succession" has always been noted as one of extreme barbarism in all matters connected with art; but it is curious to find that the effects of that barbarism extended even to our great stone circles.

The only original entrance to Mayburgh is due east, or a little south of it, and in a straight line from it in the same direction.

About a quarter of a mile off is "Arthur's Round Table," a piece of ground enclosed by a slight trench, which appeared to me to be oval,¹ the longest diameter being from north-west to south-east, with a low bank outside and an entrance at the south-east. There was a similar entrance at the north-west, but that end of the structure has been destroyed by a road being made over it. "Arthur's Round Table" somewhat resembles "Maumbury Ring," near Dorchester, but is much smaller. Both, however, seem more likely to have been amphitheatres or lists than anything else. Another similar earthwork is said to have existed a mile further south, but I did not attempt to find it.

Immediately to the north of these remains is the border of Cumberland, where I leave you for the present, hoping before long to have an opportunity of bringing before you some points respecting the circles of that county of greater novelty and interest than the melancholy account of destruction and delapidation which I have laid before you to-night.

DISCUSSION.

Dr. MICHAEL TAYLOR, late of Penrith, said that from personal knowledge of these monuments he could corroborate the general accuracy of the impressions given by the author of the paper, and participated in his regret at the partial obliteration of Karl Lofts, and of what was probably at one time one of the finest stone avenues in this country. The prehistoric remains of that part of Westmoreland had been thoroughly well examined by Canon Greenwell, Canon Simpson, and the Cumberland and Westmoreland Archaeological Society. These avenue structures could not be considered sepulchral; they were probably of the Neolithic period. He might state that the sepulchral relics of the polished Stone age and of dolichocephalic man were shown in the tunnels known as the long barrows. These were comparatively rare, but three or four still existed on Ashfell, near Kirkby Stephen, and at Sunbiggin Farm, near Shap. The sepulchral relics of the Bronze age, of which Gunnerkeld was an example, on the other hand, were numerous over that part of Westmoreland; the bowl-shaped barrow, stony cairns, and stone circles abounded on these fells. He had been concerned in the exploration of many of these, and some had furnished results of interest to this Society, in an anthropological point of view. He referred to a discovery four years ago of interments in a round barrow at Clifton, about one mile from Mayborough; the burials were by inhumation in kistvaens, with the bodies in the usual bent-up position, with urns and food vessels lying by their sides. In one case the cranium

¹ It is spoken of by some writers as a circle 29 yards in diameter, and, as I did not measure it, I cannot speak with certainty, but viewing it from the road it seemed decidedly oval.

and long bones were so perfect that the type of the individual could be determined. It was a brachycephalic adult, but of stature only 5 feet 2 inches, unusually small for a round-headed individual. His deductions were confirmed by the late Professor Rolleston, and the relics are in the Oxford Museum. His experience was that in these round barrows and cairns burials by cremation and inhumation were used indiscriminately by the same race of people at the same period of time. They occurred in close proximity to each other, and the pottery and ornamentation of mortuary urns and food vessels in both usages were very similar. In reply to a question as to the presence of cup-markings and sculpturing on the Shap stones, Dr. Taylor said that none existed at Karl Lofts or Gunnerkeld, but that on one of the isolated monoliths in the avenue there were two cup and ring cuttings, which were figured by Sir J. Y. Simpson in his monograph on Sculptured Stones. Cup and ring markings were found on the monolith Long Meg in the Salkeld circle, but the best example of a cup and ring marked stone in Cumberland was found at Redhills, near Penrith, three years ago; it was a large slab which formed the cover of a cist; it is described in "Cumberland and Westmoreland Archaeological Transactions," Vol. VI, and it is deposited in the Penrith Museum.

Miss BUCKLAND, the EARL of NORTHESK, Mr. C. ROBERTS, and Dr. GARSON also joined in the discussion.

The following paper was then read by the Director:—

QUADRILATERAL CONSTRUCTIONS at MANÉ-POCHAT-EN-UIEU and MANÉ-TY-EC, near CARNAC, explored by the late JAMES MILN, F.S.A. Scot. By Rear-Admiral TREMLETT, F.R.G.S.

[WITH PLATE VIII.]

THE late Mr. James Miln, F.S.A. Scot., when following the road from Carnac to Coët-a-touse, observed, on a gentle rising ground amid the gorse and heather, a number of weathered stones protruding through the soil, which resembled menhirs aligned. The spot is known by the name of Mané-Pochat-en-Uieu (i.e., "the hillock of the egg-basket"). (Plate VIII, fig. 1.) On examining these weathered menhirs attentively it became evident to him that they formed part of an alignment running from east-north-east to west-south-west. There were, further, at the end of these, three other menhirs outlying (and also transversely to these), two of which remained upright, their length being nearly 5 feet. Permission having been obtained from the proprietor, operations were commenced, and shortly a low wall of about 2 feet high was brought to light; it was of dry masonry and roughly constructed, having built up in it, at intervals, some

small menhirs, some of which still remained upright, but others had fallen. In following this wall a structure was brought to light having the form of a parallelogram with rounded corners; its longest side measured 110 feet, its western end being 40 feet, and its eastern end 52 feet; there was an opening (or entrance) at its eastern end which was 6 feet wide. In clearing out the enclosure it became apparent that it had been filled up with vegetable earth (humus), which had been brought and deposited there; its walls had been quite buried, leaving the menhirs protruding. Two circular constructions were next brought to light: the one marked A was situated at the western end of the enclosure; the second one, B, being on the north side and near to the boundary wall. The diameter of A is rather more than 12 feet; it is composed entirely of rough blocks of granite, which it was evident had been subjected to the effect of an intense firing, they being much reddened and quite friable. The shape or form of these structures is that of a beehive about 3 feet high; their interior was nearly filled up with a dark unctuous earth. It should be further mentioned that the three outlying stones before alluded to were on the outside of the western end of this enclosure.

The beehive construction B is precisely similar to, but is smaller than A, its diameter being only 8 feet, and its height 2 feet 8 inches. It also contained black unctuous earth. Extending from this structure, and along the boundary wall for a distance of about 25 feet by 6 feet broad, there was a stratum of ashes and burnt earth; there was a further deposit of ashes and fine particles of charcoal to the south-west of it.

The following were the contents of this enclosure:—At the foot of the menhir (I) charcoal flint chips and a shard of grey pottery; on the outside of the beehive, charcoal, five shards of coarse brown pottery, and four flint chips. To the east of the menhirs G and H, and near to that part of the wall which is thicker, a few flint chips, and some very small shards of pottery. Outside of the west wall a shard of pottery (grey). At the south wall (near M) the lug of a vase of brown pottery, also shards of the same; there were also similar shards inside the enclosure. At the east wall, near the fallen menhir (O), a fragment of red pottery and some charcoal. There was found a very small shard of red pottery in A, as also some small shards of brown pottery on the exterior of B; but, as a rule, the shards found were so small that it was quite impossible to reconstitute them.

To the south of Mané-Pochat-en-Uieu, and distant about 200 yards from it, there is another slightly raised mound named Mané-Ty-ec ("hillock of the little house"). (Plate VIII, fig. 2.)

There were three weathered menhirs projecting on its highest part E, F, and G, each being about 3 feet high; at a little distance there was another menhir H. All of these were standing upright, their lower part being imbedded. There were also some detached menhirs to the westward, forming a sort of alignment, but they were concealed by the wood.

Operations were commenced, and, as anticipated, there was soon brought to light another similar enclosure to the preceding one. The menhirs E, F, G, and H having been built up in the enclosure walls, which latter were also made of rough blocks of granite, the side AB being 120 feet long. There was further a fallen menhir at G', which had formed part of it, the opposite side CD being of the same length as AB; but the northern end of the enclosure was in ruins, and the stones much strewn about, the peasants having done this in order to procure stone wherewith to repair some of their boundary walls. The other extremity, AD, is curved, and is only 36 feet long. There is an entrance at A, which is 6 feet wide.

On clearing away the earth from this enclosure a number of stones of various dimensions were found scattered about it. In the south-western corner, D, there was a thick layer of ashes and fine charcoal, which was spread about; on the western side, between C and D, there was a space of about 12 feet long and 9 feet broad, which was also covered with ashes and fine charcoal, being of about the same thickness as the former. At the south end there was found a circular construction of stone, having a diameter of 12 feet, and precisely similar to the one at Mané-Pochat-en-Uieu, but not in so good a state of preservation; it contained black unctuous earth, the stones, as also the rock on which it was built, being much reddened from the effects of intense firing.

The space round the outlying menhir K was next examined down to the rock: great quantities of ashes and fine charcoal, as also some shards of pottery, together with the cutting part of a broken celt of diorite, were found there. Along the north wall there were found two small saws of yellow flint and a yellow flint flake, an arrow-head of black silex, as also two scrapers of black flint, eight flint chips, and a quantity of small shards of red and grey coarse pottery, together with two lugs of a vase. Along the eastern wall, AB, two grey flint chips and five yellow ones, a broken quartz hammer, as also one of granite, and thirty fragments of badly fired Celtic pottery. Along the south wall AD, a piece of a grey flint flake, thirteen flint chips, a quantity of shards of badly fired coarse brown pottery, together with some shards of black pottery well fired. A fragment of an urn coated with plumbago, a piece of pottery having undulated lines

with dots between, a piece of the same having parallel lines and dots, also a piece having circles with a dot in the centre of each. Along the west wall a great quantity of ashes and fine charcoal, an opaque grey flint chip, a primitive quern having a diameter of 18 inches and being 6 inches thick, a granite hammer, and two shards of coarse brown pottery.

Within the enclosure quantities of ashes and fine charcoal, an opaque grey flint chip, two grey flint flakes, an opaque grey flint scraper, two arrow-heads of grey flint, twelve black and grey flint chips, a quantity of small shards of pottery very coarse, some of which was ornamented with dots.

Outside, at the foot of the menhir K, a piece of a saw of grey silex, a flint scraper, a piece of grey flint, a part of a flint flake, thirty-two grey flint chips, a piece of a broken celt of diorite, half of a ring of schist, and a quantity of shards of coarse brown pottery.

Both of these enclosures are of the same form, their dimensions being nearly the same; both have been constructed on rising ground, each having its outlying menhirs, which latter were placed on the outside of the enclosure where the beehives for cremation are situated. The materials employed, as also the system of construction, are precisely similar in each case, the boundary walls being of coarse undressed stones put together without any kind of cement, and having also built up in them a series of small menhirs, some of which had remained upright. Each contained beehive structures for cremation, which had all been constructed on the same principle. There can be but little doubt of their having been used for that purpose, from the fact of their being reddened, and become friable from the effects of great heat, as also from the circumstance that they contained simply black unctuous earth. It would further appear as if the cremation had been perfect, as not a particle of calcined bone was found in either of the enclosures.

The similarity of the objects found, together with the outlying stones, might probably carry these structures back to the period of the dolmens; indeed, the remains of the calcined bones may have been collected, placed in urns, and deposited in the dolmens. No rule appears to have prevailed as to the orientation of the enclosures, and, with very few exceptions, the shards which were found were of coarse paste. This, taken in conjunction with the ornamentation and the silex, would seem to point to a rather remote period.

It is to be regretted that the shards of pottery were so small and so mixed up that it was next to impossible to put them together, or to set up a vase or urn; it would also appear as if the system of depositing urns *in cists* had not existed here as at

Nignol and Coët-a-touse; a diligent search was made for them on the outside of the enclosures, but unsuccessfully. It may be that bodies were here cremated, and that the urns were deposited elsewhere, possibly in the chambers of the dolmens, perhaps at the Mont St. Michel, at Carnac, the contents of which could not by any possibility have been cremated in that chamber.

The paste, form, and ornamentation of the pottery found much resembled that which is generally met with in the Breton dolmens, but there is an exception to the rule, namely, that of the shard which had been coated with plumbago, and similarly to the urns which were found in the circles and cists at the Nignol and Coët-a-touse. The absence of Roman bricks, tegulæ, and pottery, as also of metals, is remarkable.

The stone hammers, flint scrapers, flint knives and chips, together with the pieces of celts, which were found, resembled those which have usually been met with in the proximity of the dolmens of the Morbihan, as also of the circles of Nignol and Coët-a-touse, but they are probably anterior to the latter, especially as no metal, or even traces of it, were found either within or near to the enclosures.

There exists a third enclosure of the same kind at about one mile distant from those which have been described; it is situate on a rising ground near the dolmen of Klud-er-rier ("roosting place of fowls"). The outline of its boundary wall can be easily traced. The late Mr. James Miln had made arrangements with its proprietor, and was to have examined it as soon as the growing crop of gorse had been cut, but this plan was arrested through his very unexpected and almost sudden death.

Explanation of Plate VIII.

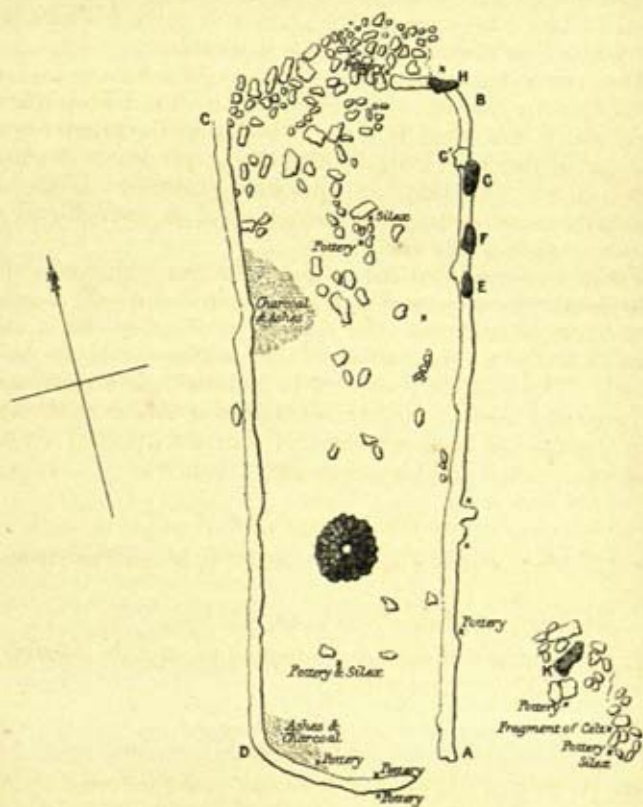
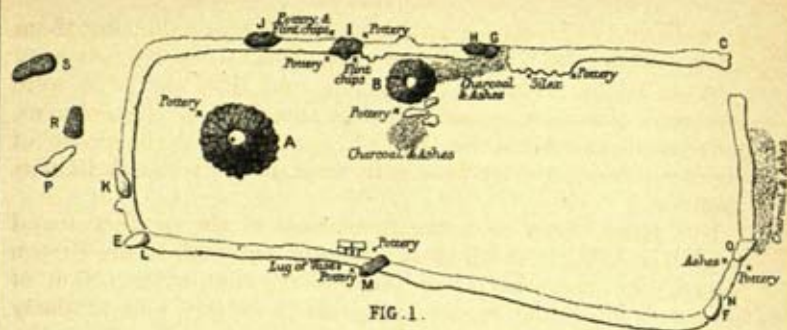
Fig. 1.—Plan of quadrilateral structure at Mané-Pochat-en-Uieu, near Carnac.

" 2.—Ditto at Mané-Ty-ec, near Carnac.

In both plans the shaded stones are upright menhirs; the others not shaded have fallen.

DISCUSSION.

Mr. A. L. LEWIS said that the paper communicated by Admiral Tremlett was of great interest, the monuments described in it appearing to be quite unique. Regarding the rude stone monuments of Brittany, he might say that, in addition to his personal knowledge of them, he had read a quantity of French publications about them (equal in bulk to about four volumes of the *Journal of the Institute*) which Admiral Tremlett had kindly lent him,



Scale of Mètres

QUADRILATERAL STRUCTURES NEAR CARNAC.

小野田製鐵所 *Onoda Iron Works*, *Yamaguchi*

and from which he had extracted particulars of the exploration of 107 dolmens and other tombs.¹ Only 15 of these contained bronze or iron, and some of these cases were rather doubtful—a fact which tended to show their great antiquity; but even if iron had been found in every one of them, it would not have shown that they were, as some said, of post-Roman origin, since Cæsar found the people of the country perfectly well acquainted with the use of that metal. He also thought that the immense number of dolmens, many of them of enormous size, which had existed in the neighbourhood of the Morbihan could not possibly have been erected in the troubled years following the departure of the Romans. The archæologists of the Morbihan appeared to be unanimous in attributing their rude stone monuments to a pre-Roman population, and Mr. Miln had conclusively proved the pre-Roman date of some of them.

A LIST OF SOME DOLMENS AND TUMULI IN BRITTANY, THE INVESTIGATION OF WHICH IS RECORDED IN THE *Bull. Soc. Arch. du Morbihan*, AND IN THE *Bull. Soc. Polymathique du Morbihan*, AND OF THE ARTICLES FOUND IN THEM. (EXTRACTED BY A. L. LEWIS, FROM COPIES LENT BY ADMIRAL TREMLETT.)

No.	Name, &c.	Stone objects found.	Other objects found.	—
1 2 3	<i>Grottes des Plouharnel.</i> (Opened in 1849— Found full of earth.)	Some fragments of axes.	2 vases, bones and cinders, and 2 bands or armlets of gold.	Gold.
4	<i>Tumulus of Tumiac in Arzon.</i> (Opened 1853.)	30 stone weapons, several stone beads.	Fragments of human bones and a mass of rust supposed to have been an iron bar.	Iron.
5	<i>Be-er-go-ah or Daul-er-groah or Men-er-Rhetual.</i> Locmari-aquer. (This had been opened anciently, and was partly uncovered.) Bulletin, 1860.	1 arrowhead.	This had been filled with Roman bricks and pottery after being opened. Burnt remains and Gaulish pottery also found.	

¹ These particulars are given in the List which immediately follows this paper.

No.	Name, &c.	Stone objects found.	Other objects found.	—
	BULLETINS, 1863 AND 1864.			
6	<i>Mont St. Michel.</i> Carnac. (Opened 1862, by M. R. Galle. Buried in mound and not previously opened.)	11 jade celts, 28 others, and 9 jasper pendants.	Coal (charbon) and fragments of bones.	
7	<i>Kercado.</i> Carnac. (Explored by MM. Lefebvre and Galle, had been previously opened.)	2 axes, jasper beads, and fragments of flint and stone.	Celtic pottery, coal and bones.	
8	<i>Manné er H' Roëk.</i> Locmariaquer. (Opened by MM. Lefebvre and Galle. Buried in mound, and not previously opened.)	90 tremolite celts, 11 jade celts (broken) 5 jasper pendants, 44 jasper and agate beads, 1 ring of jade, sundry flints.	11 Roman coins and bronze and glass fragments in the superficial earth of the mound, but M. Galle says the chamber is certainly not Roman. A curious inscribed stone was found in the mound, but outside the chamber.	
9	<i>Manné Lud.</i> Locmariaquer. (Opened by M. Galle and Dr. Mauricet. Buried in mound, and not previously opened.)	Small flint knife, part of polished axe.	Coarse pottery, traces of human bones and of at least 2 skulls. On 5 menhirs in the mound, but outside the chamber, were found 5 horses' skulls.	Horses' skulls placed on menhirs.
10	<i>Crubelz,</i> near Belz. (Explored by Dr. G. de Closmadeuc. A domed construction outside the chamber, but in the mound, was full of limy black earth.)	Flint flakes and 1 barbed arrow-head.	Traces of burnt bones. One of the capstones being uncovered Roman bricks from ground outside had fallen in.	

No.	Name, &c.	Stone objects found.	Other objects found.	—
11	<i>Kergonfals</i> , Bignon, Morbihan. (Opened by M. R. Galles and Dr. Mauricet. Bent gallery leading to chamber not previously opened.)	2 flint knives, 3 axes.	Coarse pottery, human bones, not burnt, and coal.	
12	<i>Moustoir</i> , Carnac. (Opened by M. R. Galles, and apparently not previously.)	3 flint knives, 1 axe, and some stones of unknown purpose.	5 vases and some horses' teeth. Some Roman tiles were found in mound, but not in the chamber, also 2 small deposits apparently sepulchral.	
13	<i>Ker-roch</i> , Locmariaquer. (Explored by Dr. de Cloismadeuc.)	1 white quartz bead, and some worked flints.	Celtic pottery.	
<p style="text-align: center;">BULLETIN, 1866.</p> <p>At <i>Trinité-sur-Mer</i>. (Explored by MM. Cussé and L. Galles.)</p>				
14	No. 1, <i>Mein er Roh</i> .	Flint knife and flakes.	4 Celtic vases.	
15	" 2 and 3.	Nil.		
16	" 4, <i>Er Roh</i> , Ker-			
17	marker.	Flint flakes, 1 flint knife, 1 bead, 1 barbed arrowhead.	Many fragments of Celtic pottery, a gold ornament, a piece of a wooden bracelet, and a little piece of "fer oligiste," seemingly a polisher.	Gold.
18	" 5, 6, and 7 (No-			
19	thing found			
20	but bits of pottery).			Iron.
21	On banks of { 8A	3 knives and 2 axes.	Fragments of pottery.	
22	River of Crach, { 8B E. of Kervi- lor. (All these were ruined, but not previously dug.)	5 flakes and 1 pendant.		

No.	Name, &c.	Stone objects found.	Other objects found.	—
23	<i>Kersu.</i> (Explored by Dr. A. de Closmadeuc. Found ruined and full of earth.)	2 axes, 1 barbed arrow, several flakes.	Fragments of Celtic pottery and coal.	
24	<i>Keroñ</i>	Celts said to have been found 30 years previously.	Broken pottery (all Celtic), blackened earth and coal.	
25	<i>Runesto</i> , Plouharnel.	1 worked flint—3 celts found there previously.	Ditto ditto.	
26	<i>Mané Klud-er-Ier</i> , Keriavel.	11 worked flints.	Ditto ditto.	
27	<i>Auterieu</i> , Carnac ..	1 knife and 13 worked flints.	Ditto ditto and fragments of a tube of iron.	Iron.
28 29 30 31	<i>Kerivael.</i> (4 Dolmens.)	1 arrowhead, 3 flint knives, and some other worked flints.	2 earthen beads, some Celtic pottery, blackened earth, and fragments of bones.	
32	<i>Mané Rumentur</i> , Kervello. The above were explored by MM. Galles and Gresson and Dr. G. de Closmadeuc, but had all probably been dug before.	2 worked flints.	Celtic pottery and coal, and in the mound (not in the chamber) a small fragment of bronze.	Bronze.
BULLETINS, 1867.				
33	<i>Bilgroes</i> , near Port Navalo in Arzon. (This was full of earth, and the mound had been made use of in an apparently pre-Roman intrenchment.)	Flint flakes.	Fragments of pottery.	

No.	Name, &c.	Stone objects found.	Other objects found.	—
34	<i>Rocher</i> , Plougoumelen. (Tumulus opened by Rev. W. C. Lukis, not previously explored.)	Flint scraper.	Neck of vessel resembling Roman ware and fragments of earlier pottery, burnt human bones, a nail and 2 rings of iron, and a bronze vase.	Iron and bronze.
35	<i>Quiberon</i> .	..	Coarse Celtic pottery, at least as old as that of the dolmens, and black earth.	
36	(7 cists full of earth			
37	and partly plastered			
38	with clay; explored			
39	by Dr. G. de Clos-			
40	madeuc.)			
41				
42	<i>Beg-en-aud</i> , Quiberon. (Tumulus explored by Abbé Collet.)	..	Coarse black pottery made on wheel, and remains of iron pins sticking in wood apparently ship nails, late Gaulish, perhaps running into Roman period.	Iron.
43	<i>Kerniscop</i> . (Ruined dolmen, explored by Abbé Collet.)	..	Fragments of pottery; "rog-nors de fer."	Iron.
44	<i>Beg-en-noz</i> .	..	Fragments of pottery.	
45	(Two ruined dolmens explored by Abbé Collet.)			
46	<i>Croch Collé</i> , Kerrihan. (Explored by Abbé Collet.)	3 arrowheads, many flakes and cores, a pierced axe, and a part of another.	12 broken vases.	
47	<i>Beg Portiei</i> . (Ruined dolmen explored by Abbé Collet.)	Many flints.	2 curious urns.	

No.	Name, &c.	Stone objects found.	Other objects found.	—
48	<i>Ty-er C'horriganed</i> (House of the Korrigans), Lez Variel en Guidel. (Dolmen explored by Abbé Euzenot, not previously dug, but apparently not covered.) BULLETIN, 1869.	..	Small fragments pottery, black earth and white ash. A bronze axe much oxidised and sticking to a stone, was found in the mound 0.30 metre deep, and 1 metre from the dolmen.	Bronze.
49	<i>Mané er Gatannec</i> , Carnac. (Ruined, explored by Abbé Lavenot.)	..	Fragments of pottery. A bronze axe said to have been found here.	Bronze.
50	<i>Ker-ic.</i>			
51	(Explored by Abbé Lavenot.)	No. 1. Flakes, 3 diorite axes, 1 fragment of lance. No. 2. Flint axe and flakes, and pendant of agalmatolite.		
52	<i>Mané-roh-en-Tallec</i> , Carnac. (Explored by Abbé Lavenot.)	Flakes, beads, 2 axes of fibrolite and a piece of another.	Fragments of pottery.	
53	<i>Mané-Clud-er-Yer</i> , Carnac. (Tumulus and cist explored by Abbé Lavenot.)	Flakes and a fibrolite axe.	Ditto.	
54	Two dolmens also explored by him.)	Flakes.	Ditto and coal.	
55				
56	<i>Dolmen de Malabri.</i> (Explored by Abbé Collet.)	1 worked flint.	Fragments of pottery, not unlike Roman.	
57	<i>Dolmen de la Madeleine.</i> (Ruined, explored by Abbé Collet.)	..	Ditto.	

No.	Name, &c.	Stone objects found.	Other objects found.	—
BULLETINS, 1871.				
58	<i>Mané Bolgade</i> , Ploemel. (Ruined, explored by Abbé Collet.)	Flakes and chips.	Coarse pottery with no ornamentation, iron ring and part of hatchet.	Iron.
BULLETINS, 1872.				
59	<i>Rocher</i> , Plougoumelen. (Ruined dolmen, explored by M. L. Galles.)	..	Black earth impregnated with decomposed animal substances, more than 13 bronze bracelets broken.	Bronze.
60	Ditto, Tumulus, ditto.	..	Iron and copper vessel and cover containing bones.	Iron and copper.
61	<i>Resto</i> , Moustoir-ac. (Unviolated dolmen.)	..	Dr. Fouquet says that M. de la Fruglaye found here a piece of an iron axe some iron ore and worked iron.	Iron.

Pamphlets by M. GAILLARD respecting his own Explorations.

62	<i>Grignen</i> . (Explored February, 1884—unviolated dolmen).	..	A four handled vase, a bronze lance head, and fragments of 2 other vases.	Bronze.
63	<i>Roch Kerouaren</i> . (Explored March, 1884, partly ruined dolmen.)	Many chips, schist pendant, and polished schist plaque, with hole at each end.	Coal, and a band and 4 small ornaments of gold.	Gold
64	<i>Beg-en-Havre</i> . (Explored March, 1884, dolmen ruined by shell explosion, but not dug.)	3 beads, 1 axe, 3 scrapers, 2 flakes, some chips "percuteurs."	3 round bottomed vases, bones and skulls, one of a very dolichocephalic old woman.	

No.	Name, &c.	Stone objects found.	Other objects found.	—
65	<i>Mané Bras</i> , ditto. [The above dolmens were all buried in the sand at Rouhinec, and only unearthed by the artillery practising there.] <i>Port Blanc</i> , St. Pierre, Quiberon. (Explored February, 1883.)	3 arrowheads and some flints.	1 round bottomed vase and some fragments (Celtic).	
66	No. 1. Dolmen previously entered.	Bead, 3 axes, chip.	3 vases, 2 strata of skeletons, a boar's tusk, a bone pin, and a bronze pin.	Bronze.
67	No. 2. Dolmen not opened.	Perforated stone.	Fragments of vase and bones.	
68	Fallen buried stone adjoining No. 1.	Polished stone, partly perforated, "percuteurs," and piece of axe.	One vase and fragments of others and bones.	
69 to 95	<i>Celtic Cemetery</i> , S. <i>Thinic</i> . (Explored August, 1883. Twenty-seven large and small cists close by sea.)	Stone hammers, flat stones of peculiar shape, grooved stones, &c.	Fragments of about 40 skulls and skeletons. A bone implement.	
96	<i>Ile Fervec</i> . (Cist, explored August, 1883.)	Immense quantity of flakes.	Pottery of same kind as found in dolmens.	
97	<i>Bois de Puco</i> , Erdevén. (Three cists, explored September, 1883.)	1 arrowhead, "au tranchant transversal."		
98	<i>Dolmen de Rogaté</i> , Carnac. (Ruined, explored November, 1883.)	9 arrowheads, 22 beads, 3 pendants, 1 axe, knife, hammers, and celtiform fragments.	7 apode (round bottomed) vases and 3 others.	

No.	Name, &c.	Stone objects found.	Other objects found.	—
99	<i>La Madeleine, Carnac.</i>	..	Fragments of Celtic pottery.	
100	(Explored November, 1883, dolmen previously opened and cist.)			
101	<i>Mané Remor, Plouharnel.</i> (Dolmen No. 4 ruined, explored July, 1883.)	A fine flake, 13 centimetres long, and several chips.	Ditto Ditto (perhaps a lamp) coal and cinders.	
<hr/>				
BULLETINS, 1884.				
102	<i>Gavr Inis.</i> (Digging under by Dr. de Closmadeuc.)	2 or 3 flakes.	Fragments of Celtic pottery and of shells.	
103	<i>Rohello, Baden.</i> (Ruined dolmen, explored by Dr. de Closmadeuc and M. R. Galles.)	Fragments of flint, and a small chloro-melanite axe.	Fragments of coarse Celtic pottery.	
	<i>Pen Liousse, Ile d'Arz.</i> (Explored by M. le Gouguec.)			
104	A. Ruined dolmen.	Fragment of axe.	Fragments of pottery.	
105	B. Nothing found.			
106	C. Ruined dolmen.	Axe and piece of flint knife.	2 spode vases and fragments, coarse hand-made.	
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BULLETINS, 1874.				
107	<i>La Haye, St. Grave.</i> (Cromlech or circle tomb undisturbed, explored by M. de Kerdrel.)	Small axe.	Cinders.	

MAY 12TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From the GOVERNMENT OF THE PANJÁB.—General Code of Tribal Custom in the Sirsa District of the Panjáb. Drawn up by J. Wilson, Settlement Officer. 1882.
- From the GOVERNMENT OF NEW ZEALAND.—Statistics of the Colony of New Zealand for the year 1883.
- From the UNITED STATES GEOLOGICAL SURVEY.—Third Annual Report, 1881-2.
- Geology of the Comstock Lode, and the Washoe District, with Atlas. By George F. Becker.
- From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE.—Archiv für Anthropologie. Band XV, Supplement.
- From the SOCIÉTÉ ARCHÉOLOGIQUE, ZAGREB (AGRAM).—Viestnik Hrvatskoga Arkeologičkoga Društva. Godina VII, Br. 2.
- From the AUTHOR.—Remarks on Aboriginal Art in California and Queen Charlotte's Island. By W. J. Hoffman, M.D.
- Bird Names of the Selish, Pah-Uta, and Shoshoni Indians. By W. J. Hoffman, M.D.
- From the ACADEMY.—Atti della Reale Accademia dei Lincei Serie Quarta. Vol. I, Fas. 9, 10.
- Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg. Tom. XXX, No. 1.
- Rozprawy i Sprawozdania z Posiedzeń wydziału Matematyczno-Przyrodniczego Akademii Umiejętności. Tom. XII.
- Zabytki Przedhistoryczne Ziemi Polskich wydawane staraniem Komisji Archeologicznej Akademii Umiejętności w Krakowie. Seryja I. Prusy Królewskie badań i opisał Godfryd Ossowski. Zeszyt 3.
- Pamiętnik Akademii Umiejętności w Krakowie. Wydział Matematyczno-Przyrodniczy. Tom. IX.
- From the SOCIETY.—Transactions of the Cremation Society of England. No. 2.
- Papers and Proceedings of the Royal Society of Tasmania for 1884.
- Proceedings of the Royal Society. No. 236.
- Proceedings of the American Philosophical Society. No. 116.

From the SOCIETY.—Register of Papers published in the Transactions and Proceedings of the American Philosophical Society. Compiled by Henry Phillips, jun.

—— Bulletin de la Société Impériale des Naturalistes de Moscou. 1884, No. 2.

—— Bulletin de la Société Polymathique du Morbihan. 1883, 1884.

—— Proceedings of the Royal Geographical Society. May, 1885.

—— Journal of the Society of Arts. Nos. 1693, 1694.

From the EDITOR.—“Nature.” Nos. 809, 810.

—— “Science.” Nos. 115, 116.

The election of R. BRUDENELL CARTER, Esq., F.R.C.S., was announced.

Mr. SETON KARR exhibited a collection of photographs of natives of Algeria.

Mr. SEPPING WRIGHT exhibited a large oil painting, being a portrait of the Maori king Tawhiao.

Dr. A. T. BRETT exhibited a preserved tattooed head of a Maori.

Dr. JOHN EVANS exhibited a piece of jade, partially worked as a small hatchet.

EXHIBITION of JADE OBJECTS.

By the Right Hon. the EARL OF NORTHESK.

LORD NORTHESK exhibited a very fine collection of jade implements, principally from New Zealand. Having been called upon to speak, he stated that he had not prepared a paper, being under the impression that the discourse by Mr. Kerry-Nicholls would be found sufficient to occupy the entire evening. He simply wished to call attention to a selection from his general collection of stone implements calculated to illustrate Mr. Kerry-Nicholls' remarks on New Zealand; but on some future occasion he would have pleasure in reading to the Institute a paper dealing more particularly with the implements in jade and other materials used by the Maoris. On the present occasion he would confine himself to the description of a few of the rarer and more conspicuous objects exhibited on the table, some of which he believed were unique. His collection consisted of weapons nearly all procured in Europe, either by purchase or by gifts from archæological friends. He believed the series, as a whole, was perhaps without a rival.

One axe deserved particular attention, not only from its great size, measuring 18 inches in length, but also from the purity of the jade, or, as it was more familiarly called by the Maoris, "greenstone," and from the fact of its edges being beautifully crenulated or worked. No other example of similar workmanship was known. The Meri-meris or Patoo-patoos were thoroughly representative, there being three in jade, one extremely large, and another of quite a translucent material. Three were wrought in basalt and one in a greenstone.

The gods, or "tikis," which were suspended round the neck and worn often as charms as preventives against disease, were interesting; they ranged in size from $1\frac{1}{2}$ inches to 6 inches in length.

A necklace of perforated jade beads was described as extremely rare, as also were some of the ear pendants. The largest of the latter was quite straight and translucent, measuring $6\frac{1}{4}$ inches in length. The smaller ones were of very rare type, especially one shaped like a shark's tooth. Other ear pendants would be found to be quite transparent, and, although at first glance might be taken for jade, were in reality a precious green serpentine, perhaps a variety of bowenite. No specimens cut in this rare material by the Maoris were known to exist in other European collections. The formidable circular jade axes which were so deftly handled were from New Caledonia, in which country they were called *nbouets*, and are specially mentioned in the "Voyage in Search of La Perouse." It was pointed out that a small apple-green axe exhibited was the identical specimen figured in that work. The largest axe, nearly a foot in diameter, was perhaps unequalled for its size, and for the purity of the material, an apple-green jade. It was mounted in a handle 18 inches in length, terminating in a cavity containing nuts or stones, which are rattled about to keep time to the primitive dance of the Papuans. The handle is covered with a native cloth bound round with cord.

DISCUSSION.

Mr. JOHN EVANS made some remarks on the methods by which the jade implements from New Zealand appeared to have been manufactured. He pointed out that upon a large proportion of them there were marks showing that a process of sawing had been employed in roughly fashioning them. The saw used might either have been a piece of stone or of hard wood or bone, used in conjunction with sand or corundum, if forthcoming. He called attention to the fact that most of the neolithic implements, formed of fibrolite, and of frequent occurrence in France and Spain, showed distinct marks of having been sawn in a similar manner. The saw-kerf was

usually made on both sides of the stone, and when carried in to a little depth the stone was broken in two along the line marked by the saw. A similar sawing process had been in use for various hard stones by the Lake-dwellers of Switzerland. He exhibited a somewhat worn New Zealand axe of jade, on which two lines, joining each other at an obtuse angle, had been sawn or cut with the intention of removing a portion of the blade for the purpose of making a curved earring. This interesting specimen had been brought from New Zealand by Professor Moseley, F.R.S.

Mr. RUDLER called attention to the fact that several minerals of green colour, quite distinct from one another in chemical composition, were popularly included under the general name of jade. The true jade, or *nephrite*, is a mineral closely related to hornblende, and consists essentially of a silicate of lime and magnesia. Its specific gravity, which is a character of diagnostic value, varies from 2.91 to 3.06. The species termed *jadeite* by Damour is quite a different mineral, its affinities being rather with epidote than with hornblende. This mineral is a silicate of alumina and soda, with a density ranging from 3.28 to 3.35. Without recourse to the test of specific gravity, it is not always easy to distinguish between nephrite and jadeite. In consequence of the use of jade in the manufacture of axe-heads in New Zealand and elsewhere, the mineral is sometimes known as *Beilstein*. The fibrous variety of New Caledonia differs in certain characters from the normal nephrite, and has been termed "oceanic jade." The subject of jade has for many years engaged the attention of Professor Fischer, of Freiburg-in-Breisgau, who has written almost exhaustively on the subject; and of late years valuable contributions to our knowledge of this material and of its uses have been made by Dr. A. B. Meyer, of Dresden.

The following paper was then read by the author:—

THE ORIGIN, PHYSICAL CHARACTERISTICS, and MANNERS and CUSTOMS of the MAORI RACE, from data derived during a recent exploration of the King Country, New Zealand. By J. H. KERRY-NICHOLLS, F.R.G.S.

Introductory.

THERE are perhaps few aboriginal races which have awakened at all times so keen an interest in the science of ethnology as the Maoris of New Zealand. From the period at which the race was first made known to Europeans there has naturally been a desire to learn more and more of a people who have at all times been remarkable for their singular intelligence, their

fine physical characteristics, their nobility of character when at peace, and their courage when at war.

Much has already been written of the Maoris in a cursory way, but a complete history of this interesting branch of the human family remains to be produced. There is a great amount of native lore still extant among the Maoris, especially among the older natives, and there is yet time to save many valuable traditions of the race from extinction. Information of this kind will become more valuable as time rolls on, since the history of the Maori race must form one of the most brilliant chapters in the records of New Zealand. In time to come the Maoris will take the same place in the annals of the colony as do the ancient Britons in the history of Great Britain, and it would therefore be the more a subject for regret if the as yet unrecorded traditions of an intelligent aboriginal people, now fast disappearing, were allowed to pass into oblivion forgotten and unknown.

The information which I shall place before you on this subject has been derived from personal observation during my recent exploration of the King Country, or that part of New Zealand which may be said to form the last stronghold of the natives, and where I found the Maoris living in their primitive mode of life.

Native Tradition of the First Maori Migration.

Whence the Maoris originally came, or at what period they arrived in New Zealand from their mysterious dwelling-place beyond the sea, is one of those interesting events in connection with their history which have been lost in the dim vista of the past. The Maoris of the present day refer to Hawaiki as the fatherland of their race, and hence the proverb, *I kune mai i Hawaiki te kune kai te kune tangata* ("The seed of our coming is from Hawaiki, the seed of man"); but of the locality of Hawaiki, besides the belief that it was an island somewhere in the broad waters of the Pacific, absolutely nothing beyond conjecture is known. They have, however, a distinct tradition that their ancestors migrated to New Zealand in certain canoes, the names of which, with the principal historical events connected with them, have been handed down from father to son through countless generations.

According to general tradition the first of the Maori race to reach *Aotearoa*, or the "Land of Bright Sunlight," as the North Island was termed by its original discoverers, was Te Kupe. This hero is said to have separated the North Island from the Middle Island, and thus to have formed the wide channel of water known as Cook Strait.

When Te Kupe returned to Hawaiki he gave such a glowing account of the size, beauty, and products of Aotearoa, that a fleet of canoes was immediately raised by his people to proceed to the newly discovered country. Each canoe was under a separate navigator, and contained representatives of the principal Hawaikian tribes, with the head chiefs and *ariki*s, or high-priests, and it was the final dispersion of these canoes to different parts of the North Island which gave rise to the great tribal divisions of the race, as represented at the present day. All the various tribes claim that their progenitors came to New Zealand in one or other of these canoes, but the several traditions connected with the arrival and dispersion of the Hawaikian fleet are naturally shrouded in much mystery. The following particulars, however, have been derived from information afforded to me by King Tawhiao, Topia Turoa, Te Wheoro, and other reliable chiefs.

The *Aotea* canoe was commanded by Rangi-te-Hau. It contained the ancestors of the Ngatihau, Ngatiapa, and those of kindred tribes. It brought the *mouku*, or *paratawiti*, an edible fern, and the *pukeko*, a swamp bird.

The *Arawa*, which is said to have been the largest of the fleet, was commanded by Tama-te-Kapua, and arrived at Maketu. The ancestors of the Ngatiwhaka-aue of Rotorna and of the principal tribes of the Lake Country came in it. The *Ariki* Ngatoroirangi, the first explorer of the island, with his slave Ngauruhoe, after whom the crater of Tongariro is named, arrived in it. It brought the *kiore*, or rat, and the *kumara*, or sweet potato.

The *Kurahaupo* was navigated by Te Ruatea. It sailed to Waitotara with the ancestors of the Ngatiawa, Ngatiruanui, Ngaururu, and kindred tribes.

The *Tainui* had for its chief Te Hoturoa. It touched first at Whangaraoa, and sailed thence to the Tamaki river, where the voyagers saw the *kuaka*, a gull, flying inland, which indicated a sea beyond. He therefore proceeded up the Tamaki to Otahuhu, and discovered the Manukan Harbour, and touched at Awitu, whence it sailed to Kawhia, where a block of stone is still shown by the natives of the present day as the petrified prow of the canoe. In it were the ancestors of the Waikatos, the Ngati-maniapoto, and Ngatituwharetoa, while the Ngapuhui, the Rarawa, and other allied tribes also claim for their ancestors a place in it. It brought the *Kakariki*, or green parrot, and the seeds of the *Karaka* tree, which it distributed along its course up the Tamaki.

The *Takitumu* was commanded by Tama-a-te-Hau, and arrived at Waitemata. It brought the Ngatiwhatua, Ngatitai and ancestors of kindred tribes.

The *Tokomaru* had Te Manaia for its navigator. It proceeded to the mouth of the Mokau, where it lost its *punga*, or stone anchor. It was afterwards beached at Waitara. It brought the progenitors of the Ngatiama and Taranaki, with those of other allied tribes.

Probable Origin of the Maori Race.

Many theories have been advanced as to the probable origin of the Maori' race. Its presumed migration has been variously traced from the Sandwich Islands, the Samoa Islands, the Fijis, the Tonga Islands, from South America, Easter Island, and finally from the *Mori-orio* of the Chatham Islands. These latter islands were, without doubt, peopled by a race cognate to the Maoris. As already pointed out, the Maoris of to-day have a well-authenticated tradition that Hawaiki was the original home of their race, but, as a matter of fact, there is no evidence, legendary or otherwise, to indicate, with any degree of certainty, where that land was situated; but, as the vague tradition of the Maoris concerning their first migration tends to show that Te Kupe, who is represented as the first discoverer of New Zealand, returned to Hawaiki with tidings of his good fortune to his tribe, there is thus far more reason to presume that the latter country situated at no great distance from the newly discovered land, and that it was in all probability one of the Tonga islands.

Some writers assert that Hawaiki has not a geographical, but a mythical signification. I am not by any means of that opinion. During my travels among the Maoris, I made it a practice to endeavour to glean all the information possible with regard to the current traditions respecting Hawaiki, which was always represented to me by the various tribes throughout the country as an island somewhere in the east, in the direction of the rising sun. Again, other authors point to Hawaii of the Sandwich Islands as the fatherland of the race, on account of the similarity which that name bears to Hawaiki. It should, however, be borne in mind that the islands of the Pacific bear names very similar, such, for instance, as *Savaii* in the Samoan group, while it should at the same time be remembered that, if we accept Hawaii as being the original Hawaiki, Te Kupe, who according to the legend first discovered New Zealand, and returned to his people, would have had to perform a journey of over six thousand miles, while the original canoes, freighted with male and female emigrants, would have had to undertake a voyage of over three thousand miles before they reached the new land.

Turning again to the Tonga Islands, not only do the Maoris

¹ The word "Maori" signifies anything native or indigenous to the country.

bear a marked physical resemblance to the natives of that group, but many of their manners and customs are very similar to those of the islanders. There is also a very remarkable affinity between the Maori and Tongan languages—so much so, in fact, that the natives of the two countries find little difficulty in conversing when brought in contact with each other. It is likewise worthy of remark that the word “Tonga” is of frequent occurrence in the Maori language.

Thus, *tonga*, a southern region; *he hau tonga*, a south wind; *tonga*, a blemish on the skin; *tonga-ko*, to fester; *tonga-kotara-tara* and *tongama-uru*, south-west wind; *tonga-mimi*, a bladder; *tonga-nga*, uncooked, raw, broken; *tonga rerewa*, an ornament for the ear, a word of endearment, a treasure; *Tonga-riro*, the active volcano held sacred by the Maoris; *Matua-a-Tonga*, literally “Father of Tonga,” the name of the stone idol said to have been brought in the *Arawa* canoe from Hawaiki; *Paratetai-tonga*, the name of the south end of Mount Ruapehu, also *whaka-tonga*, to keep one’s-self quiet, to restrain one’s feelings, to entertain feelings which one does not show outwardly; *whaka-tonga-tia*, to be murmured at, be found fault with secretly. The name of the principal island of the group is *Tonga-tabu*, literally “Sacred Tonga”; *Hunga-tonga* and *Rara-tonga* are also adjacent islands. Thus each of these proper names is compounded of Maori words, very common in that language at the present day. Hence in *tabu*, or *taboo*, as it is sometimes written, may be traced the *tapu* of the Maoris, both words in the respective languages having the same signification, i.e., to render sacred; *hunga* signifies in Maori a company of persons, while *rara* is a frequent term of various significations. Again, as showing the affinity of many of the native names of the islands with those of Maori words of the present day, it may be remarked that a short distance to the east of the Tonga group there are three islands which geographically form part of the same group, named respectively *Aitu-taki*, *Manga-ia*, and *Oheteroa*. In the Maori language the signification of these names may be translated as follows:—*Aitu* denotes a spiritual deity; *taki* signifies to take to one side, take out of the way, to tow with a line from the shore; *Manga* is equivalent to the branch of a tree or river; and *ia* implies a current, a sound made by rushing water; while in *Ohe-te-roa* there is a remarkable resemblance to the word *Aotea-roa*, the Maori name, as before pointed out, for the North Island of New Zealand.

Again, when taking into consideration the geographical position of the Sandwich Islands, and other groups of the Pacific, as compared with that of the Tonga Archipelago and neighbouring islands, the distance from New Zealand of the latter is

a little over a thousand miles, an inconsiderable journey for sailing canoes, which were capable of carrying from eighty to a hundred men.

Although it is impossible to define, by any theoretical line of reasoning, the exact course followed by the Maoris in their migration to New Zealand, many circumstances would seem to point to the conclusion that they came with the gradual spread of the Malay race through the eastern islands of the Pacific to the more southern groups dotting the north-eastern seas of New Zealand, the nearest of which to that country would be the Tonga Islands. Navigating the seas as the Malays did, and do at the present day, in fleet canoes, it is only reasonable to suppose that the migration of the race would spread step by step southward, linking together in its course every island available for occupation, until Te Kupe set out with his adventurous crew to seek a new world, and sighted the shores of New Zealand.

Whatever may have been the original course of their migration there can be no doubt that the Maoris owe their origin to the Malay stock. To trace the singular dispersion of so numerous and important a division of the human family over so wide an area of the globe as it now covers, and under conditions which become perplexing by reason of the wide stretches of ocean they embrace, forms one of the most interesting studies in ethnology.

The races inhabiting what I may term the Australasian division of the Pacific consist of three distinct divisions of mankind: (1) the Australian aborigines inhabiting that continent and the islands adjacent to its shores. (2) The Papuans inhabiting New Guinea, the islands immediately to the eastward of it, the Santa Cruz Islands, Bank's Islands, the Fijis (where there is, however, a considerable admixture of Malay blood), the New Hebrides, and extending southward as far as the Loyalty Islands and New Caledonia, the distribution of the race being distinctly marked within those limits. (3) The Malay race inhabiting the extensive and numerous islands of the Malay Archipelago, and extending its offshoots eastward through the Caroline Islands and various other groups to the Sandwich Islands, the Marquesas and Low Archipelago, and to the Samoan and Tonga groups to New Zealand.

During a course of travel I made through Australia, and through the principal islands of the Western Pacific, as far north as New Guinea, the distribution of the three races, as here laid down, could be distinctly traced, both by their physical characteristics as well as by their language and peculiar manners and customs, and so clearly were the lines of demarcation

between the respective races defined within the limits pointed out, that there exists no difficulty whatever in tracing distinctly where the distribution of one race begins, or that of another ends.

It is probable that the spread of the Malay race over the islands of the Pacific began at a very remote period, but at what era population set in cannot at this time be determined, as there are no data on which to rely with certainty. But whatever opinion may be formed of the identity of the Malay race in its wide dispersion from its cradle in the torrid islands of the Indian Ocean to the distant islands of the South Pacific, the striking resemblance in person, feature, language, and customs, which prevails among the tribes inhabiting the various groups of islands over which the race has spread, justifies the conclusion that the original population issued from the same source and that the physical peculiarities and other characteristics which distinguish the tribes or communities on different islands have been mainly brought about by long separation, local circumstances, and diversity of climate.

Physical Characteristics.

The Maoris may be considered as the finest aboriginal race of the Pacific. In their physical characteristics they are well-built, well-shaped, and erect in figure, with broad chests and massive rounded limbs, which usually display great muscular development. The average height of the men is about 5 feet 6½ inches, but there are many who exceed that standard. The stature, however, of both sexes, which varies considerably in different parts of the island, seems to attain its largest proportions in the elevated regions surrounding Lake Taupo, where may yet be seen some of the finest specimens of the Maori race, both male and female.

As a rule, the chiefs with the Maoris are tall, display a martial and independent air, and move about with a bold and dignified carriage. The tallest native who came under my observation was Mohi, a chief of the Ngatimoharetoa tribe of Taupo. He was a man of herculean build, standing barefooted over 6 feet 4 inches. The next in degree was Pehi Hetan Turoa, chief of the Whanganui tribes, about 6 feet 3 inches. The next largest man was Wahanui, chief of the Ngatimaniapoto tribe, who, with a height of over 6 feet, was besides remarkable for the great size of his head, the fine physical development of his limbs, and the extraordinary breadth of his chest and shoulders. He had a singularly large mouth, and would frequently devour a large-sized sucking pig at a meal. The smallest men I found among

the Maoris were at Ruakaka, in the valley of the Whanganui. They were living at an altitude which was just 1,200 feet lower than where I had found the tallest of their race.

The Maoris, as a rule, have long bodies and long arms, with short legs, and the frame throughout is massively set; in bodily weight and girth of chest they are equal to Europeans of similar stature. The feet are short and broad, and the hands small and tapering. The features are regular in form, the face is broad with high cheek-bones, slightly prominent, and the forehead is high and massive; the nose is depressed at the bridge, the nostrils are wide, and the mouth is large and firm, the jaw square and massive, the lips are well cut, and slightly full; the teeth, square and strongly set, are very white and even; while the eye, large, of a dark brown colour, and shaded by long lashes, is well set, and is quick and penetrating in its glance.

I have often observed in pictures and drawings, and even in sculpture, the Maori represented as a "hatchet-faced" individual, with an aquiline nose and receding forehead, and altogether portrayed with a physiognomy of the ideal Red Indian type. This is an error into which an artist who designs from imagination may fall. Individuals possessing those facial characteristics are very rare among the Maoris.

The hair with the Maori, like that of his allied type the Malay, is coarse, black, and straight. In former times it was allowed to grow long, and was twisted in the form of a knot on the top of the head; it is now by the male sex worn in the European way. The skin, sleek, and of a brown coffee colour, becomes darker in some individuals.

The features of the Maori women are flatter than those of the men, and in stature the latter are considerably shorter. There are, however, many marked exceptions to this rule. In general, their limbs are well modelled, while both their shoulders and hips are remarkably broad. The feet are small and arched at the instep, and the hands are well shaped, with tapering fingers. The hair, which is coarse, and of raven blackness, falls in long waving tresses over their shoulders. Their eyes are large, dark, and lustrous, and their teeth, beautifully even, are of a pearly whiteness. They tattoo the lips in thin blue horizontal lines, which are extended in a cluster of waving curves under the lower lip to the chin. The lobes of their ears are pierced, and in them they wear long pendulous earrings of *pounamu*. In deportment they are pliant and graceful, and in manner easy and courteous. They age quickly, and when old have a miserably emaciated appearance. Many of the younger women often exhibit considerable personal beauty.

The children and young people of both sexes are remarkably

bright and intelligent, while they are often handsome in face, and graceful in figure, deformity being very rare among them.

The intercourse between the European and Maori has given rise to an intermediate class of individuals, which now forms a connecting link between the two races. The half-castes are not only remarkable for their fine, well-formed persons, but also for their intellectual powers. Their skin is usually of a *café au lait* colour, the eyes dark, and the hair, long and straight, is either black or brown. In all other respects they retain the usual Maori characteristics. Many of the women of this class are remarkable for their personal beauty, which partakes somewhat of the Morisco-Spanish type. Although possessing as fine a physique, the half-castes are not equal in stamina to the pure bred Maoris, while they age much faster than other members of the race.

It is worthy of remark that alliances are usually brought about between the two races by a European marrying a Maori woman, an event which in the early days of the colony was of frequent occurrence, and even at the present day unions of this nature are not infrequent. Individually, I never came across an instance where a Maori had taken unto himself a European wife.

The finest half-caste I met was at a tribal gathering in the King Country. He was a youth of about twenty, standing over 6 feet 4 inches, stout in figure, and with a singularly massive frame. He was remarkable among his tribe for his extraordinary muscular strength.

Present Condition of the Maoris.

There can be no doubt whatever that the Maori race is greatly on the decrease. In Cook's time (1769) the whole native population was estimated as exceeding by a little 100,000, but I am of opinion, from evidences which I have seen of what must have been at one time a very numerous population, that this was a very low estimate for that period. In 1859 it only amounted to 56,000; of this number 53,717 fell to the North Island, and only 2,283 to the Middle Island. In 1881 the number had decreased to 44,099, of which 24,370 were males, and 19,729 females. At the present rate of decrease, about the year 2000 the Maoris as a race will be extinct.

The three principal diseases conducing to the decay of the race I found to be phthisis, chronic asthma, and scrofula, the two first being principally brought about, I believe, by a half-savage, half-civilised mode of life, and the latter from maladies

contracted since the first contact with Europeans. It is, however, clear that there are a large number of natives yet distributed throughout the King Country, and among them are to be found, as of old, some of the finest specimens of the human race. A change of life, however, different from that followed by their forefathers has brought about a considerable alteration for the worse among the rising population, and although during my journey I met and conversed with many tattooed warriors of the old school, who were invariably both physically and mentally superior to the younger natives, it was clear that this splendid type of savage would soon become a matter of the past. I found the natives of the King Country living much in their primitive style, one of the most pernicious innovations, however, of modern civilisation amongst them being an immoderate use of tobacco among both old and young.¹ Although most of the native women were strong and well proportioned in stature, and apparently robust and healthy, there appeared to be a marked falling off in the physical development of the younger men when compared with the stalwart muscular proportions of many of the older natives, a result which may no doubt be accounted for by their irregular mode of life when compared with that usually followed by their forefathers, combined with the vices of civilisation to which many of them are gradually falling a prey.

It may be interesting here to relate the opinion given to me by Pehi Hetan Turoa, one of the principal chiefs of the King Country, as to the apparent reason for the rapid decay of the Maori race. The chief spoke thus: "In former times we lived differently. Each tribe had its territory. We lived in *pas*² placed high upon the mountains. The men looked to war as their only occupation, and the women and young people cultivated the fields. We were a strong and healthy people then. When the *pakeha*³ came everything began to die away, even the natural animals of the country. Formerly, when we went into a forest, and stood under a tree, we could not hear ourselves speak for the noise of the birds—every tree was full of them. Then we had pigmoris and everything in plenty; now, many of the birds have died out. A few years ago there was a big green parrot in these forests; now it is gone, and lots of other things

¹ It is a remarkable fact that the Maori women of the present day, although of splendid physique, are not nearly so prolific in offspring as in former times. It would be interesting to ascertain whether the immoderate use of tobacco of recent years among old and young of both sexes has conduced to this result.

² This word is often written *pah*; but as a consonant is never used as a terminal in the Maori language, the addition of the *h* is an innovation.

³ *Pakeha* is a term used by the Maoris to designate Europeans; it means a stranger or a person from a distant country.

have gradually faded away. In those times the fields were well tilled; there was always plenty of provisions, and we wore few clothes, only our mats of feathers. Then the missionaries came and took our children from the fields. Then came the war between the *pakeha* and the Maori, that split up our homes and made one tribe fight against another, and after the war came the *pakeha* settlers, who took our lands, taught us to drink and to smoke, and made us wear clothes that brought on disease. What race," said the old chief, "could stand against that? The Maori," he continued, "is passing away like the *kiwi*, the *tui*, and many other things, and by-and-by they will disappear just as the leaves of the trees, and nothing will remain to tell of them but the names of their mountains and their rivers."

Religion.

The native religion of the Maoris still exercises a widespread influence over the people. It may be described as a kind of polytheism, a worship of elementary spirits and deified ancestors. They never possessed a system of religion containing a code of moral and spiritual truths. Their worship consisted in the propitiation of their deities, in accordance with certain usages performed by their priests. The elementary spirits were called *atuas*, or gods. They were omnipotent and omnipresent. They might rest in the heavens, float in the air, appear in the whirlwind,¹ dwell on the mountain top, abide in the lake or river, haunt the forest or desert plain, take up their abode in the body of a great chief, or in that of a *tohunga*, or priest. These spirits possessed the attributes of being able to work evil or to do good, but only in a roundabout, mysterious way. Every object of superstitious regard was said to be possessed of an *atua*. The *atua* sometimes assumed an imaginary form, or it might be simply a spirit dwelling in some other body in which it had taken up its abode.

Many of the gods possessed special powers and presided over certain things. Hence Irawaru was the god of dogs, lizards, and rats. Kanika was the deity who placed the seed of fire in the trees. Maru was the great god of the Whanganui river. Mata-ao, a god who is said to have turned the world upside down. Mani was a deity who is said to have fished up the North Island, which is sometimes referred to in the traditions of the natives as *Te Ika a Mani*, the fish of Mani. Otuma-i-a-rangi was a god of the fern root. Pani was god of the *Kumara*. Papa, god of the earth and of the rivers. Pepe was god of the moth and

¹ The *awhiwhio*, or whirlwind, is said to have been a favourite way in which the gods manifested themselves to men.

butterfly. Potiki was god of infants, a form often assumed by the deities. Rehua was a god to whom offerings of food were made by the sick. Rongomai was the great god of Taupo; he presided over war. Ru was a god of the lakes, rivers, and earthquakes. Tane was god of the *tui* and birds, and Tangaroa was the god of fish. Taupotiki was the deity who first created the sun, moon, and stars. Tawaki was an inferior god of Taupo, who fed on human bodies. Tiki is said to have been the first man, and was elevated into the dignity of a god. Tote was the god of sudden death. Tu was a god supposed to reside in the wind. Uenuku was god of the rainbow; he was a god of battle, and the feathers of the hawk were sacred to him.

Stone Idols.—Perhaps the most interesting relics which have been handed down through the dark annals of Maori tradition into the light of the present day are the two stone *atuas*, or gods, which are said to have been brought from Hawaiki in the *Arawa* canoe. One, a small squat figure, a little over a foot in height, is now in the possession of Sir George Grey, to whom it was presented by the natives; the other is *Matua-a-Tonga*, or "Father of Tonga," to which I have before alluded. It is worthy of note that these are the only stone images of which the Maoris have any record.

For countless ages—in fact, ever since his arrival in the *Arawa* canoe—this singular idol had been buried on the island of Mokoia, in Lake Rotorna, until one day, at the time when I was on my way to the King Country, a chief, who claimed the god by virtue of tribal right, dug up the deity and removed it to the mainland. I therefore had an opportunity of examining it. It was an oval-shaped stone image, the length of the figure being about 4 feet, the greatest girth about 6 feet, and the weight about 3 hundredweights. The stone was carved to represent a human being squatting on the haunches, with the legs shortened, the knees drawn close up to the body, and the arms flat against the chest; the hands were extended upwards, with one palm against the breast, and the other resting under the chin; the head and hideous face were inclined backwards, while the spinal column and other parts of the body were rudely sculptured in exaggerated proportions.

The Maoris assert that this god was the father of the race. *Matua* in Maori is equivalent to parent or father. The natives believe that every living thing had a *matua*, or father, a first parent or creator, who in their mythology ranked as an *atua*, or god. Hence *Irawaru*, as before pointed out, was creator or god of dogs, lizards, and rats; *Tane* of birds; *Tangaroa* of fish; and so on.

Deified Ancestors.—Next in importance to the elementary

gods were the deified ancestors of the race, who were held in the highest estimation. They consisted of the progenitors of the principal tribes, before and after the migration from Hawaiki, and their valorous renown was held up as an example to be followed by all. They were represented in the *runanga*, or council houses of the natives, in the form of wooden idols of life size, elaborately carved with slanting eyes, protruding tongues, and defiant mien, and were painted with red and white pigments, and they presented altogether a barbarous appearance, in every way calculated to inspire the Maoris with that feeling of superstitious veneration with which they regard all matters connected with their past history. A man might be deified in this way before or after death. All the chiefs, warriors, and priests who arrived in the first canoes were rendered sacred in this manner.

Taniwhas.—With the other fabulous creations of Maori mythology were the *taniwhas*, or evil demons, mysterious monsters in the form of gigantic lizards, who were said to inhabit subterranean caves, the deep places of lakes and rivers, and to guard tapued districts. They were ever on the alert to upset canoes and to devour men. Indeed, these fabulous monsters not only entered largely into the religious superstitions, but into the poetry and prose of Maori tradition.

Makutu and Tapu.—There were two other remarkable observances connected with the religious superstitions of the natives—the practice of divination to dispel *makuto*, or witchcraft, and the *tapu*, or power of rendering sacred persons and things, and declaring it sacrilege to touch them. The *tapu*, which resembles in every way the taboo of the South Sea Islanders, is held in great awe by the natives, and to do anything calculated to break its power or influence is considered as an act sufficiently grievous to merit death. The mysteries of divination were only practised by an inferior class of priests. Chiefs alone could perform the mystic rites of *tapu*.

Tohungas, or Priests.—The principal ministers of religion were the *tohungas*, or priests. Besides holding an exalted tribal rank, they were believed to possess miraculous powers, and were consequently extremely influential both with the chiefs and people. They were supposed to be able to interpret dreams, to explain prophecies, to cast out demons, to dissipate disease, to restore the body to health, to create rain and quell storms; they moreover foretold death, war, good and bad seasons, and all other important events bearing on the interests of individuals and of the tribes. They formed, as it were, the medium through which the *atuas* were worshipped, and it was their province to propitiate them by songs, incantations, and charms, and the

sacrifice of food. The Maoris always offered their firstfruits to their gods. This offering was called *mata*.

Superior Being.—Apart from the mysterious deities with which the Maoris surrounded their religious worship, there is every reason to believe that there existed among them a vague conception of a Superior Being who presided over their destinies. There is abundant indication of this in many of their traditions and usages. This Great Deity is known to all the race. There is, however, a large amount of floating tradition as to His power, which is differently interpreted by different tribes.

The Reinga and Po.—The Maoris appear to acknowledge the existence of the soul after death, when it is supposed to assume the form of the body when in life in a spiritual way. They do not believe in corporeal resurrection, nor, like many savage races, in the transmutation of souls into an inferior condition of existence. They seem to entertain a somewhat undefined belief in a hereafter, and with that they have their *Reinga*, or Heaven, and their *Po*, or Hades; but it is difficult to define what are really the true conceptions suggested by these respective abodes of happiness and woe in the minds of the natives. A spirit named Taipo, possessing evil powers not unlike those of our own Satan, is the presiding genius of their abode of the condemned.

The most prevailing notion of their *Reinga*, or Heaven, would appear to be that it is an extensive and beautiful region, the earthly portal of which is the North Cape, at the extremity of the North Island. Here the spirits of the departed are said to assemble, and to take their flight across the sea towards their final home. It would appear that everything in this idealistic land is beautiful and abundant, a constant calm prevails over the heavens, and the canoes float lightly over the sleeping waters. In this spirit realm, where there is no sound of battle, but perpetual sunshine and gladness, it is believed that the high priests and chiefs, and all those to whom the spirit of the *atuas* are propitious, find their abode after death.

The Tangi.—Closely allied to the religious superstitions of the Maoris is their veneration for the dead. The moment an individual dies, no matter whether belonging to the highest or to the lowest rank, his body is *tapued*, as it were, by the hand of death, and is rendered sacred. Before the burial, the corpse is laid out and arrayed with wild flowers, a *tangi* or lamentation for the dead is held, and both men, women, and children mourn for many days. It often happens that the corruption of death has far advanced before the body is consigned to the grave, when, if it be that of a chief or warrior, his weapons are buried with him, and prayers and incantations are performed over the

spot by the *tohungas*. After a certain lapse of time the body is disinterred by the tribe, and the bones, when carefully collected, are deposited in caves, which are strictly *tapu*.

When travelling through the King Country a mountain was shown to us containing large caves, in which the bones of Potatau Te Wherowhero, the first Maori king, had been placed after their removal from Ngaruawhaia. These caves contained likewise the remains of many noted chiefs, but as they were made known to us by a native under a pledge of secrecy I am prevented from defining their whereabouts. The locality was, however, a delightful one, surrounded by tall mountains, and it appeared to be a fitting resting-place for the last representatives of a brave and noble race.

Christianity.—It was not until the year 1814¹ that the first light of Christianity dawned upon the Maori race. About that time Protestant and Roman Catholic missions were established in various parts of the country, and gradually a religious conversion was effected over a considerable section of the natives, more especially among the tribes inhabiting the northern portion of the island. In this way a great moral and social reform was brought about among the Maoris; but, imbued as the natives were with the deep-rooted superstitions connected with their ancient faith, the conversion was, to a considerable extent, at least with many of the tribes, and especially with those of the interior, merely nominal. This lack of Christian faith is remarkable with the natives of the King Country at the present day. Thus at Ruaka, a large native settlement situated in the midst of an extensive forest region, where I found the Maoris living much in the same way as they must have done before the arrival of Cook, when I questioned them upon their religious principles they frankly replied, "We believe in nothing here, and get fat on pork and potatoes."

Hauhauism.—The unstable hold which Christian teaching had made upon the minds of the natives was exemplified to a remarkable degree in 1864, when a fanatical religion called *Hauhau* sprang into existence. The term *Hauhau* was applied to the followers of this faith, on account of their ejaculating the word frequently during their prayers. The mode of practising the Hauhau religion was remarkable. A pole, called a *pai marire*, was erected in the centre of a settlement. At the foot of it the *tohunga* recited his prayers in a loud voice, the worshippers walked round the pole in a circle, repeating the words

¹ In this year the first missionary, the Rev. Samuel Marsden, Colonial Chaplain to the Government of New South Wales, landed with some followers of the Cross at the Bay of Islands, where the first missionary settlement was formed among the Ngunpuhi tribe.

of the priest, and now and again raising their hands towards the *pai marire* and shouting *hauhau* in a loud voice. The word *hau* in Maori signifies wind, and the worshippers, when thus repeating it, called upon their gods who were supposed to manifest themselves in the air. This new creed, which was accepted as a national faith by the tribes in rebellion against the British sovereignty, was a curious mixture of the primitive religions and superstitions of the race, and perverted Biblical truths, and the fanaticism to which it gave rise forms one of the most striking features in the bloody annals of the New Zealand war. During the war the rebels recognised themselves in battle by raising the left hand and shouting *hauhau* in a tone that resembled the barking of a dog.

Domestic Arts.

The domestic arts with the Maoris never attained to a very high standard. Up to the period of the first outbreak of war with the Europeans the natives lived in fortified *pas*. Like the feudal strongholds of old they were placed on heights in commanding situations, and could only be reached by certain approaches which were at all times strictly guarded. The hill on which the *pa* was situated was encircled by a *pare pare toruarua*, or fosse. Surrounded by a *kereteho*, or fence, up the declivities, flat terraces and taitas or barricades were formed, while the *woharoa*, or entrance to the fortification, was elaborately decorated with grotesque figures representing renowned warriors of the tribes, and above which again were pointed poles, on which were placed the heads of vanquished enemies. Near to the entrance was the *taumaihi*, an elevated stage which served as a watch tower; in the centre of the enclosure stood the *runanga* house where the chiefs assembled, where the deified ancestors were enshrined, and where the *tohungas* muttered their *karakias*, or prayers, and performed their mystic incantations, while around were the *whares* of the principal warriors, with the gables and portals curiously carved and painted in colours of black and red. Below on the plain was the *kianga*, or open settlement, dotted with native huts and cultivated spots where the *kumara* and *taro* grew.

Food.—Up to this time the food of the Maoris was very much like that of the present day, and then, as now, they prepared it in the rudest fashion, cooking it in ovens formed of heated stones. They ate the fern root (*Pteris esculenta*), the *kumara*, the *aro*, and the *poaka* or pig,¹ the *kiwi*, the *weka*, the *kuku* or

¹ The pig was first introduced into New Zealand by Cook.

pigeon, the *parera* or duck, and birds of other kinds. The *tuna* or eel, the *manga*, and the *koura* they caught in the lakes and rivers, and the shark, and other fish they obtained in plenty from the sea. They drank only the pure water from their mountain streams, and they knew of no intoxicating beverage until their contact with Europeans. They had no stimulating drink like the *kava* of the South Sea Islanders, but at a certain season of the year they extracted a kind of sweet nectar from the ripe berries of the *tutu*¹ (*Coriaria sarmentosa*).

Tattooing.—The Maoris excelled in the art of tattooing beyond any other people. The tattooing for each part of the face was known by a separate term. Thus, *erewha* was to tattoo the upper eyelid; *hupe*, the joint of the nose; *kokoti*, the cheeks; *kowhaha*, the lower maxilla; *ngu*, the summit of the nose; *paepae*, the malar bones; *ponguigia*, the nostrils; *putarniga*, the ears; *rerepehi*, the cheek; *repi*, the lines from the nose to the chin; *titi*, four lines on the middle of the forehead; *tiuhaua*, over the brows and temples. The blue dye or colouring matter called *kapara* is prepared from the soot obtained by burning the heart of the *kahikatea* and *rimu* trees.

The mode of tattooing practised by the Maoris is unlike that followed by any other race. Many of the chiefs and warriors have the visage completely covered with curious designs of blue curved lines, extending from the throat to the very roots of the hair. These artistic devices are so arranged that the skin of the face is often completely covered, even to the corners of the eyes and frequently over the eyelids. The operation is performed by means of a sharp bone instrument called a *uhi*, by which the skin is punctured, and during this operation the blue dye is rubbed in the wounded part. So painful is the operation that only a small portion of the skin can be operated on at one time, so that in this way many months often elapse before the ordeal is completed. Special artists are employed to carry out this singular custom. Before the operation is performed every hair of the beard and moustache has to be carefully plucked out until all trace is obliterated and the skin is reduced to a state of complete smoothness. This is done to remove any obstacle to the fantastic tattooing which is considered as one of the chief signs of manly dignity. The tattoo marks were considered by the Maoris not only as a sign of dignity, but as adding to their fierce appearance when in battle, and a man with his face thus

¹ The poisonous leaves of this plant act much in the same way on cattle as do those of the *wharangi* (*Melicope ternata*). The black seeds of the *tutu*, when eaten by man, are said to produce raving delirium.

decorated always took rank as a warrior and could not be reduced to the condition of a slave. The word *moko* is the general term for the tattooed lines on the face; *tapai* signifies an untattooed face, which was formerly considered as a sign that the man would be willing to be made a slave rather than submit to the ordeal of the tattoo. Many of the older Maoris of the present day have finely tattooed features, but the practice is dying out among the younger natives. One of the finest specimens of a tattooed warrior I met at Hengia, in the King Country. He was a very old man of about seventy, his pinched sharp features being tattooed in the most elaborate way, the thin blue lines forming a complete network over every part of his countenance.

Mokaikai.—It was this singular custom that gave rise to the *mokaikai*, a process of embalming heads by saturating them with the pyroligneous acid of wood. This custom was at one time very common with the Maoris, who thus preserved the heads of their ancestors, the skin and tattoo marks of the face remaining perfect for many years.

Weapons.—The principal weapon of war with the Maoris was the *huata*, a short spear-like implement beautifully carved at the top to represent a grotesque human head, from the mouth of which the tongue protruded about 3 inches in the form of a spear blade. Just below the top it was ornamented with a white tuft of dog's hair, bound with flax stained a bright red; the shaft of the weapon, made usually of *totara* wood and brightly polished, was rounded towards the upper end, but widened out in oval form with sharp bevelled edges towards the bottom. It was usually used as a club, the upper end of the shaft serving for the handle. Besides this there was the *patu-patu*, a weapon made of wood or whalebone shaped like the top of a violin, the *pancha*, a small war hatchet with a stone head, the *taihaha*, a spear barbed with shark's teeth and ornamented with feathers, and the *timata*, a sharp-pointed wooden spear. They also used the oval-shaped sharp-edged paddles of their canoes as clubs. Perhaps the most remarkable weapon was the *mere*. It was only used in war by the chiefs, and was considered as an emblem of rank and authority. It was handed down as an heirloom in a tribe, and was so highly prized that to secure one in battle was considered an act of glory, just as the taking of a stand of colours might be with us. The *mere* was, however, always considered a formidable weapon in fight. When using it, it was customary to aim at the head. It was also used by the chiefs to cleave the skulls of the captured. It is worthy of note that the Maoris, like the Australian aborigines, and unlike all other races of the Pacific, did not accustom themselves to

the use of the bow and arrow, and not being acquainted with the manufacture of metals they had no weapons or tools of that character. In the making of their weapons, as in the carving of their canoes, houses, and other things, they used only rude stone tools, with shells and the teeth of the shark.

The Pounamu.—The polishing of the *pounamu*, or greenstone, was another art in which the Maori attained to considerable perfection. This stone, a species of nephrite or jade, is only obtained from the west coast of the Middle Island, the native name for which is *Wahipounamu*, or "Land of the Greenstone." It is much prized by both sexes as an ornament either for the neck or ears, and for the manufacture of *meres*. The custom of wearing ornaments of this description is common among many races. Both in China and Japan jade is prized beyond all other stones. Throughout the Malay Archipelago jade ornaments are much worn by the islanders. On the island of Tanna, in the Hebrides, I found several of the natives wearing a kind of nephrite, very similar to the *pounamu* of the Maoris. It was said to be only obtained in small quantities in the vicinity of Mount Yasur, the active volcano of the island. A similar kind of stone is common in New Caledonia and New Guinea, where it is used for the blades of adzes.

Carving.—In the art of wood-carving the Maoris undoubtedly excelled all other savage races. Their implements of war were chastely designed in this way, and they extended the art in a remarkable degree to the effigies of their deified ancestors, to the palisading of their *pas*, and to their houses, the decoration of which presented all those singular varieties of curved and twisted lines which form one of the most remarkable features in the varied designs of Maori decorative art. In fact, it is the wonderful blending of the circle and sweeping curve which adds to the carving of this ingenious race its special and most attractive charm, and places it far beyond that of any other savage people for beauty combined with a unique and graceful simplicity.

Manufactures.

The Maoris are particularly skilful in preparing the fibre of the *harakeke* (*Phormium tenax*), or New Zealand flax plant, and other native grasses, and in plaiting and weaving mats and baskets, which they embellish with artistic designs in various coloured dyes, which they extract from the barks and roots of trees. They make cloaks of dog-skins and beautiful *korowais*, or capes, from the hair-like feathers of the *kiwi*.

Former Healthfulness of the Race.

From what I could learn from many of the aged Maoris they appear to have been, from their account, a singularly healthy race before the advent of Europeans among them. At that time it would appear the most common diseases were rheumatism, among the aged; *paipai*, a cutaneous disorder; and the *hakihaki*, or itch. One of the most insidious of contagious maladies, before entirely unknown to them, was, it is asserted, introduced by the crew of a whaling vessel, soon after the arrival of the first Europeans, to whom likewise the natives attribute the introduction of phthisis and other kindred complaints. Besides the other diseases to which I have alluded elsewhere as conducing principally to the decay of the race, the Maoris, especially those living in the vicinity of European settlements, frequently suffer from typhoid and other of the common fevers; but epidemics of a more serious nature are infrequent among them, although they have a tradition that an epidemic disease of a very virulent character visited the country before the whites arrived, and carried off great numbers of the inhabitants.

Medicine.—Of the science of medicine the Maoris know very little, and their nostrums are obtained principally by the infusion of plants, herbs, and the barks of trees. They, however, place great faith in the curative properties of the mineral waters in which their country abounds.

Native Pharmacopœia.

Harakeke (*Phormium tenax*), the New Zealand flax decoction of leaf and root, used for *paipai*, a cutaneous disease, also as a purgative and worm medicine.

Horopito, a shrub decoction of leaves, used for *paipai*.

Huhu, a grub found in the *rimu* (*Dacrydium cupressinum*), *matai* (*Podocarpus spicata*), and *Kahikatea* (*Podocarpus dacrydioides*) are eaten as a medicine.

Kahikatea (*Podocarpus dacrydioides*), decoction of leaves used for internal complaints.

Kareas (*Rhipogonum scandens*), decoction of roots used as sarsaparilla; the young shoots are eaten as medicine for the *hakihaki*, or itch.

Kawakawa (*Piper excelsum*), leaf used for the *paipai*, and to heal cuts and wounds.

Kohekohe, a powerful tonic; a weak infusion of the leaves stops the secretion of milk.

Kohukohu, a lichen, when dried and reduced to powder is applied to cutaneous eruptions.

- Kopakopa* (*Trichomanes*); the leaf is used to heal ulcers.
- Koromiko* (*Veronica sulcifolia*); an infusion of the leaf is a powerful astringent; a weak infusion, a tonic; the leaves are applied as a poultice for ulcers. A decoction of the leaves is valuable in dysentery. A small portion of the leaf, if chewed, soon produces a keen sense of hunger.
- Mamaku* (*Cyathea medullaris*); the bruised pith is used as a poultice for sore eyes.
- Miro* (*Podocarpus ferruginea*); a weak infusion of the bark is taken for stomach-ache.
- Mouku*, an edible fern; a wash obtained from the root is used for sore eyes.
- Ngareku*, charcoal, powdered fine, is used for cutaneous diseases.
- I'apanuga*, the infused bark is drunk for the *hakihiaki*.
- Papa-auma*, or mistletoe; the bruised bark is applied for the itch by rubbing it over the skin.
- Paretau* (*Asplenium obliquum*), a large-leaved fern; the root is used for *paipai*.
- Patete*, the sap is used for scrofulous sore and ringworm.
- Bohutukawa* (*Metrosideros tormentoso*); an infusion of the inner bark is used for diarrhoea.
- Pukatea* (*Atherosperma Novæ Zelandiæ*); the bark is used for scrofulous sores.
- Raorao* (*Pteris esculenta*); tender shoots used for dysentery.
- Rata* (*Metrosideros robusta*), infusion of bark used for dysentery.
- Rauriki*, or sow-thistle; an infusion is used for stomach complaints.
- Rimu* (*Dacrydium cupressinum*); an infusion is used to heal running ulcers.
- Tawa* (*Nesodaphne tawa*), the bark is used for stomach-aches and colds.
- Ti* (*Cordyline australis*); an infusion of the leaves is used for dysentery.
- Toatoa* (*Phyllocladus trichomanoides*); the leaves are used for scrofulous diseases.
- Tutu* (*Coriaria ruscifolia*); the tender shoots, when plucked at certain seasons, are taken for dysentery.
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APPENDIX.

List of the New Zealand Tribes, with their Localities.

These tribes constitute the principal divisions of the Maori race.

Name of Tribe.	Locality.
Aopouri	North Cape to Hokianga.
Ngapuhi	Bay of Island.
Ngatiwhatua and Uriohau	Manukau, Kaipara, and Waitemata.
Ngatitai	Firth of Thames and Auckland.
Ngatipaoa	Cape Colville to Katikati.
Ngatierangi	Katikati to Maketu and inland.
Ngatiwhaka-aue	Maketu and Lake Country.
Ngatiraukawa	Otaki Arowhenua.
Waikato	Valley of Waikoto and Manukau.
Ngotimaniapoto	Valley of Waipa to Mokau.
Ngatiawa	West Coast from Mount Egmont to Mount Taupiri, Waikanae, and Wellington.
Te Whakatohea	Bay of Plenty and inland.
Ngatipouri	Cape Runaway and inland.
Ngatituwharetoa	Lake Taupo and centre of North Island.
Ngatitama	From Mokau inland.
Taranaki	West Coast near Mount Egmont.
Ngatiruanui	Waitotara and inland.
Ngarauro	Waitotara to Whanganui inland.
Ngatihau	Whanganui inland.
Ngatiapa	Raugitane, Whanganui River, and inland.
Ngatitoa	Near Wellington.
Ngatikahungunu	Table Cape to Palliser Bay and inland.
Te Urewera	Taupo to Poverty Bay.
Whanaupanui	Cape Runaway to Bay of Plenty and inland.
Raugitane	Admiralty Bay and vicinity.
Ngahitao	South and Middle Islands.

DISCUSSION.

Dr. ALFRED THOMAS BRETT, who exhibited the preserved head of a New Zealander from his museum, explained that the head was formerly in the museum of W. Stuart, Esq., of Aldenham Abbey. It showed very well the marks of extensive tattooing on the face, and also the long black straight hair. The facial angle was good. Dr. Brett wished to ask one or two questions. Had it been observed that the cranium of a Maori was unusually thick? Dr. Brett recollected that a native of New Zealand died in Guy's Hospital of pneumonia in 1849, and the well-developed form of the man was noticed by all, especially the well-formed head. When a post-mortem examination was made, the brain was found not to be so large as the shape of the head would have led one to infer; the space was filled up with an unusual thickness of the walls of the

skull: this was so remarkable that a wax model of the brain and of the skull was made by Mr. Towns, and is now in the Anatomical Museum of Guy's Hospital.

Professor FLOWER and Professor KEANE also joined in the discussion.

[Dr. GARSON has since stated that the Maori skulls in the Royal College of Surgeons' Museum do not, as a rule, present any unusual thickness which might serve as a race-character.]

JUNE 9TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From the INDEX SOCIETY.—A List of English Indexes. By Henry B. Wheatley, F.S.A.
- From the BUFFALO HISTORICAL SOCIETY.—Obsequies of Red Jacket at Buffalo, October 9th, 1884.
- From the BRITISH ASSOCIATION.—Souvenir of Winnipeg.
- From the SEC. DE FOMENTO, GUATEMALA.—Informe dirigido al Señor Secretario de Fomento, sobre los trabajos practicados por la Oficina de Estadística en el año de 1884.
- From the AUTHOR.—Notes on Prof. E. B. Tylor's "Arabian Matriarchate." By J. W. Redhouse, C.M.G., LL.D.
- Some Laws of Phonetic Change in the Khitan Languages. By John Campbell, M.A.
- The Khitan Languages: the Aztec and its relations. By John Campbell, M.A.
- Corrigenda and Explanations of the Text of Shakespeare. By George Gould.
- Miscellaneous Notes on Deneholes, 1883. By T. Vincent Holmes, F.G.S., M.A.I.
- Rapport à M. le Ministre de l'Instruction Publique sur une Mission aux Iles Philippines et en Malaisie (1879–1881). Par M. le Docteur J. Montano.
- On the Track of the Crescent. By Major E. C. Johnson, M.A.I., F.R.Hist.S.
- From the ACADEMY.—Atti della Reale Accademia dei Lincei. Serie Quarta. Vol. I, Fas. 1, 2.
- From the ASSOCIATION.—Journal of the Royal Historical and Archaeological Association of Ireland. No. 59.

From the ASSOCIATION.—Report of the Fifty-fourth Meeting of the British Association for the Advancement of Science; held at Montreal in August and September, 1884.

From the INSTITUTION.—Journal of the Royal Institution of Cornwall. Vol. VIII, Part 3.

—Journal of the Royal United Service Institution. No. 128.

From the SOCIETY.—Journal of the Society of Arts. Nos. 1695–1698.

—Proceedings of the Royal Geographical Society. June, 1885.

—Scientific Proceedings of the Royal Dublin Society. Vol. IV (N.S.), Parts 5, 6.

—Scientific Transactions of the Royal Dublin Society. Vol. III. (Series II), Nos. 4, 5, 6.

From the EDITOR.—Bulletino di Paletnologia Italiana. Anno XI. N. 1^e, 2.

—Matériaux pour l'Histoire de L'Homme. May, 1885.

—L'Homme. 1885, Nos. 1–10.

—Revue d'Ethnographie. 1885, No. 1.

—"Science." Nos. 117, 191, 120.

—"Nature." Nos. 811–814.

By permission of the authorities of the Alexandra Palace, a family of Lapps, consisting of three men, two women, and two children, were exhibited, in illustration of Professor Keane's communication. With them were exhibited a dog, sledge, reindeer skins, and other objects of ethnological interest.

PRINCE ROLAND BONAPARTE exhibited a very large collection of photographs of Lapps.

Mr. P. A. HOLST exhibited three coloured photographs, as samples of a collection of 240, representing all the Russian Empire.

*NOTE on the LAPPS of FINMARK (in NORWAY), illustrated by
Photographs. By H.H. PRINCE ROLAND BONAPARTE.*

THE following anthropological data were collected during a recent tour of three months in Scandinavia. In the course of my journey I endeavoured to study the Lapps from two points of view—anthropometrically and ethnographically. I need not refer, however, to the ethnographical details, as these are already familiar to most anthropologists, thanks to the writings of Von Düben¹ and Friis.² I shall therefore dwell rather on the anthro-

¹ G. Von Düben, "Om Lappland och Lapparne, företrädesvis de Svenske." Stockholm, 1873.

² Friis, "En Semmer i Finmarken, Russisk Lapland og Norkarelen," Kristiania 1880. Friis, "Fra Finmarken," Kristiania, 1881. Friis, "Lappisk Mythologi, Eventyre og Folkesagn," Kristiania, 1871.

pometric results, for on this subject we possess less information, Mantegazza and Sommier being the only writers who have treated the subject with any fulness. The measurements which I now submit to the Institute have been taken on about 150 individuals, born in the provinces of Tromsö and Finmark, Russian Lapland, and Karasuando in Sweden.

There are at present 25,367 Lapps distributed as follows:—

Norway ¹	..	..	15,718
Sweden ²	..	..	6,404
Finland ³	..	..	1,038
Russia ⁴	..	..	2,207

But before entering into further details I would remark that there are hardly any pure Lapps, unless we consider as such the 1,073 nomad Lapps who still live in the kingdom of Norway, and who are hindered by their mode of life from crossing with strangers. The fact that pure Lapps no longer exist is easily explained when we consider that the northern provinces of Norway and Sweden are invaded by Finns who very readily cross with the Lapps, and give rise to a multitude of mixed breeds. This slow invasion, which has already been going on for a long time, will result—though it is true at a distant date—in the complete disappearance of the Lapp group—not by their destruction, but by their fusion into another race. Thus, in 1876 there were in the province of Finmark 7,008 individuals called Lapps, and 2,865 Finns, with 2,628 half-breeds of different races. In all the Lapp families whom I visited I found one or more members whose physical constitution declared their Finnish origin—whence we may conclude that the 7,008 individuals called Lapps in the Norwegian statistics are not of pure race.

I have now the honour to offer for presentation to the Anthropological Institute a series of 101 anthropological photographs which have been taken in the course of my tour. Each Lapp was photographed in full face and in profile, the two positions being rigorously exact, whence it follows that all these photographs are comparable among themselves.

The measurements made on the living subjects were taken according to Broca's method, and yielded the following results.

¹ Norges Officielle Statistik. Resultaterne af Folketaellingen i Norge i Januar, 1873. 3die Hefte. Kristiania, 1880, p. 350.

² Unpublished information communicated by the Central Statistical Bureau of Stockholm.

³ Bidrag Finlands Officielle Statistik. VI. Befolknings-Statistik, 31st December, 1880, pp. 12, 13.

⁴ Information furnished by Professor Von Düben.

The Lapp is short in stature, the mean height of 200 individuals being 1·53 metres for the men, and 1·47 m. for the women. The Lapp is brachycephalic; the preceding series of individuals gave a mean index of 87·63 for the males, and 86·17 for the females. The Lapp has a round visage, the mean facial index of 198 individuals being 80·32 in the men, and 80·04 in the women. The cheek-bones are prominent, the eyes small and sunk, the colour varying generally (in 65 per cent. of the individuals examined) between the first two lines of Broca's chromatic table. The eyelashes are scanty, and in many cases altogether absent, having been lost by the affections of the eyes to which the Lapps are peculiarly subject, through living continually in a smoky atmosphere. The sight is very good; 38 individuals had an index of $V = \frac{6}{5}$ of Snellen, and in 5 of them $V = \frac{5_1}{5}$.

The nose is rather small, and very much inclined forwards, as may be seen in many of the photographs exhibited, which represent the type we mostly met with. The profile of the nose varies between the numbers 2 and 3 of Broca's instructions. The mean nasal index is 74·59 for the males, and 73·64 for the females (in 121 individuals). The mouth is large, the mean for 120 subjects being above 5 centimetres. The lips are of moderate size and straight; the teeth vertical, and often worn; the chin is pointed; the hair is wavy and shining; many of the Lapps become bald early. They have but little beard; and this, when present, is sparse. The colour of the skin varies between numbers 24 and 26 of Broca's instructions: it is often deepened by the smoke in which the Lapps habitually live, and by dirt. Even young men have the skin much wrinkled, and this, added to the other characters previously cited, makes them appear prematurely old.

The voice is high-pitched and rather weak. The legs are generally short; the ratio of the seated figure to the erect figure being for 112 subjects, 52·90 for the men, and 52·98 for the women; but it should be remarked that appearances rather deceive in this respect, as the Lapp always stoops in walking. The ratio of the head to the total height is, on an average of 110 individuals, 14·23 for the males and 14·53 for the females.

In consequence of defective nutrition the Lapp is always thin, but his muscular system is well developed. He is very agile, is a good walker, and in winter, by aid of snow-shoes, covers enormous distances on the ice. The Lapps enjoy good health, but

¹ Dr. H. Snellen, "Optotypen, tot bepaling der Gezichtscherpte." Utrecht, 1882.

they lose many children for want of due care. In temper the Lapp is mild; he seeks to gain his end by a ruse rather than by violence. Although every one carries a knife, sanguinary conflicts are rare. It is often supposed that the Lapps live in a savage state, but this is quite incorrect; they enjoy the same rights and are subject to the same duties as the Norwegians among whom they live.

Such are the chief anthropological results of my journey in Lapland. I may add that I intend preparing a work on the Lapps similar to that in which I have treated of the inhabitants of Surinam, in Guiana, a copy of which I have presented to the library of the Anthropological Institute.

The following paper was then read by the author:—

THE LAPPS: Their Origin, Ethnical Affinities, Physical and Mental Characteristics, Usages, Present Status, and Future Prospects.

By Professor A. H. KEANE.

To the members of this Institute, devoted as they are to the special study of mankind, an intellectual treat of no ordinary interest is now afforded by the enterprising management of the Alexandra Palace, which, without inconvenience to ourselves, offers us the rare opportunity of observing on the living subject the physical qualities, social usages, and domestic life of perhaps the most interesting group of aborigines still surviving in Europe. A section, as it were, of the Arctic region of Lapland has been brought to our very doors, and we are this evening invited to make the personal acquaintance of its present inhabitants. They are here in our very midst, not indeed for the first time, for a few individual members of the race have ere now found their way sporadically to our shores; but certainly for the first time in a compact family group, affording with their "furniture and fixings," objects and implements of daily use, some even of their domestic animals, a picture in miniature of the whole life of the people drawn directly from nature.

The Lapp Domain—Statistics—Divisions.

The geographical area, to which these Hyperboreans have long been restricted, comprises the extreme north-western corner of the Continent, and may be roughly described as the whole region lying between the Atlantic and White Sea, west and east, and between the 65° north latitude and the Arctic Ocean, south and

north. But this wide domain, some 150,000 square miles in extent, consists mostly of bleak uplands and lacustrine basins, shrouded for three-quarters of the year in a thick mantle of snow. Hence it is but sparsely occupied by partly settled, partly still nomad Lapp communities, subject politically to the three governments of Russia, Sweden, and Norway, and numbering altogether considerably less than 30,000 souls. In Russian Lapland there appear to be not more than 3,000; in Swedish Lapland (Lappmarken) 6,700; in Norwegian Lapland (Finmarken) 15,700, besides over 1,000 half-caste Lapps and Kvains.

According to their geographical position and social pursuits they are grouped by their neighbours in two or more broad divisions. Thus we have—

In Russia: Fishing and Mountain Lapps.

In Sweden: Fishing, Forest, and Mountain Lapps.

In Norway: Sea, River, and Mountain Finns (Lapps).

Here the expression "Mountain" may be taken as synonymous with nomad, while the other terms imply a more or less sedentary life, either as agriculturists along the arable riverain tracts and in the forest glades, or as fishers on the coast. Of the Russian Lapps the majority are still nomad, but those of Sweden and Norway are nearly all settled, chiefly on the rivers and coastlands. In 1875 there were not more than 1,073 in Norway still wandering with their reindeer herds over the Finmarken fields, or between their upland pasturages and the sea-coast. But this section is ethnologically by far the most important, being the least mixed with foreign elements and in every way the best representatives of the race. Fortunately for our purpose to it also belongs the little family group whose acquaintance we have now the pleasure of making.

The Anti Family.

They come from the district of Karasjok, about the lower reaches of the Karasjok river, near its confluence with the Tana, which flows north to the Tana Fjord, nearly midway between North Cape and the Varanger Fjord. The group comprises altogether seven persons, all except two members of one family, whose names and ages it will be convenient here to place on record:—

1. Ole Nilsen Plavna, a Mountain Lapp, 40 years old.
2. Amund Johannesen Anti, formerly nomad, but since his father's death a River Lapp, 30 years old.
3. Ellen Johannesen Lindi, Amund's wife, 29 years old.
4. Johannes Larsen Anti, Amund's cousin, 20 years old.

5. Anders Amundsen Anti, son of Amund, 3 years old.
6. Johannes Amundsen Anti, son of Amund, 9 months old.
7. Anna Johannes Datter Guttorn, maid-servant, 21 years old.

These must, I suppose, be taken as average specimens of the Lapp people, probably as pure as are anywhere now to be found. At the same time, if free from Norse intermixture, they certainly present some remarkable peculiarities, which will engage our attention when we come to speak of the physical type of the Lapp race.

Nomenclature—Lapp—Finn—Samé.

Ethnical names, such as Kanaka, Sarte, Kelt, are too often a source of perplexity to the student, and Lapp nomenclature may be described as specially bewildering. It was seen above that the Norwegian division are classed as "Finns," and that the *Fin*-marken of Norway corresponds to the *Lapp*-marken of Sweden. In the daily press our visitors have also recently been described as "nomad Finns with reindeer and sledges, &c." This expression caused some surprise to ethnologists, who were not aware that there were any "nomad" Finns surviving in Europe, the Finnish people proper being everywhere settled under an orderly and well-administered government.

But the explanation is easy, the confusion being due, like so many other troubles, to a misunderstanding not of *things* but of *names*. Whatever its origin, the term *Lapp* would appear to be of comparatively recent date, occurring first in the plural form "Lappar" in a Norse document about the year 1200, and again as "Lappien" in Saxo Grammaticus (1230) and in a papal Bull about the same time. It is still unknown, not only to the people themselves, but also to the Danes and Norwegians, who always speak of the Lapps as "Finner," or "Finns." Hence the inference that the above-quoted expression from the daily papers was inspired from a Danish or Norwegian source.

But although recent, Lapp is now the collective name of the race in Sweden (*Lappar*), in Russia (*Lopari*), and amongst English-speaking peoples. It is also more convenient, because more discriminating, than *Finn*, although the latter is certainly more correct, both from the anthropological and national stand-points. It indicates, in fact, the connection of the Lapps with the Finnish family, of which they are evidently an outlying branch; and it is moreover the Teutonic translation of the national name *Samé*, pl. *Samelats*, that is, literally, "Fen men," whence also *Samé-ädnam*, "Fen-land" (Finland), the name of the country. This is a curious instance of the survival of a name after

the thing indicated has long passed away. Certainly the present Lapland cannot be described as a "fen-land," for it is mainly a plateau from 500 to 2,000 feet above sea-level, often mountainous, with some lacustrine basins, but few marshy or fenny tracts. Nor, strictly speaking, should its inhabitants any longer call themselves *Samelats*, or "fen people"; only this name they retain as a reminiscence of the days when they still dwelt amid the fens and lakes of the present Finland, whence they migrated northwards at some remote epoch. Those who remained behind, that is, the present Finns, also call themselves *Samelats*, or rather, in their dialect, *Suomalaiset*, from *Suoma* = a fen; and the same root occurs in the national name of the *Samoyedes*, who have carried it in their wanderings half across Siberia.

The meaning of the word *Lapp* has been much discussed and diversely interpreted as a nickname in the sense of *low* (base), low (in stature), greedy, nomad, sledge-folk, cave-dwellers, and so forth. But we seem to have the cue to its true meaning in the compound term *Lappe-gunda*, occurring in the reports of two missionaries, who in 1220 visited Estland (Esthonia), and passed thence northwards. This word is good Finnish for "Land's End," from *lappi* = end, extremity, and *gunda* = territory, district, land. The Lapps are therefore for their southern neighbours simply the inhabitants of an *Ultima Thule*, that is, of the remotest region known to them.

Nevertheless, Dr. F. Svenonius, in his account of Swedish Lapland, visited by him in the year 1884, rejects this derivation, and explains it in the sense of *cave*, *recess* (*lappah*), a name given by the Scandinavians to the people from their habit of living or taking refuge in early times in the caves or recesses of the mountains. He remarks that it is a common thing even now for the Lapps to seek shelter in such places in bad weather, or for the night when travelling. But this is not a characteristic trait, or anything more than what other people would do under like circumstances. A more plausible suggestion is that of Professor Friis, of Christiania, who refers the term to an old Finnish root *läppä*, meaning to roam, or wander about, in allusion to their nomad habits. But whatever its original sense, in the mouth of the southern or more civilised Lapps it has become synonymous with rude or barbarous, and is so applied by them to the less cultured northern communities.¹

Origin—Affinities.

In their present domain the Lapps are true aborigines, if not autochthones in the Hellenic sense of this term. In other

words, although not "men of the soil," springing from the very ground on which they dwell, they seem to have been undoubtedly its first, as they still are its almost exclusive, inhabitants. Here they have lived from prehistoric times, and here they have remained long enough secluded to have become differentiated physically and intellectually from all the surrounding peoples. So distinct are they in some respects that affinities have been sought for them in the men of the stone ages of Central and Western Europe, and bold theories have been advanced tracing their lineage directly back to the cavemen, contemporaries of the mammoth, cave bear, cave hyæna, and other extinct fauna of pre- and post-glacial times. It is suggested, rather than asserted, that towards the close of this epoch, as the temperature rose and the glaciers retreated, they slowly withdrew with their reindeer herds northwards to their present habitations within the Arctic circle.

But there are many serious objections to this plausible theory, which, in fact, has never been generally adopted by anthropologists. The Lapp domain no doubt formerly stretched farther south than it now does, reaching in Russia down to the Neva, and in Scandinavia considerably below the parallel of Trondhjem.² But the so-called "Lapp graves" occurring throughout the southern parts of the peninsula show by their contents that they were the burial places, not of the Lapps, but of the Norse people, who appear to have occupied this region since neolithic times.

Nor was the Lapp migration from Central Europe northwards, but from Central Asia westwards. In their national legends dim traditions still linger of their Eastern origin, and we have seen that their very name connects them with Finland, as the last stage,³ so to say, of their long wanderings from the Altai and Baikal regions through Siberia and East Europe to the Atlantic seaboard. In their myths and folklore occur descriptions, which can refer only to the Altai highlands, and Lake Baikal itself seems to be here indicated as a sort of point of dispersion for the Lapp race, just as in the Polynesian legends Hawaiki is referred to as the primeval home of the Maori, Tahitians, Samoans, and so many other South Sea Islanders.

Notwithstanding many discrepancies due partly to long isolation in different surroundings, partly to intermixture, the Lapps would appear to be an offshoot of the great Finno-Tataric (Uralo-Altaic) family, which, besides extensive tracts in East Europe, occupies the whole of Northern Asia as far south as the Chinese, Tibetan and Iranian frontiers. To this widespread division of the Asiatic world they belong still in speech

and in some prominent physical characteristics. The Lapp language is admittedly a near relation of the Finnish, which is itself closely allied to the Tûrki and other members of the Mongolo-Tatar group.

Physical Features.

The type also seems to be fundamentally, and in some respects even typically, Mongolic. Thus the form of the head is not only brachycephalic, a marked feature of the Mongol races, but brachycephalic in the highest degree. The cephalic index ranges, according to Retzius, from 80 to 83·50, while measurements as high as 84·0 have been recorded by Pruner Bey, and 85·07 in one instance by Broca. These figures are supported by those now taken from our visitors by Dr. Garson.

That this high degree of brachycephaly has always characterised the race seems evident from the seven skulls of pagan Lapps collected from ancient graves near the head of the Varanger Fjord by A. G. Nordvi, and by him in the year 1878 presented to the London College of Surgeons. Of these skulls, as measured by Professor Flower, four are above 80, and one as high as 84·7. The age of the graves cannot be accurately determined, but from their general appearance and contents they are evidently very old, and may be described as pre-historic. The wonderfully well preserved state of the crania is attributed by Mr. Nordvi to the dry and airy nature of the locality, and to the flat stones covering and lining the bottom of the graves.

In stature also the Lapps occupy an extreme position in the Mongol group, being the shortest people not only in Europe, but in the whole of the eastern hemisphere, the Aetas, Andamanese, Akkas, and other distinctly dwarfish races alone excepted. Mr. Nordvi gives for eight men measured by him an average of 5·0·3 feet (extremes 4·9·5—5·2·6), and for three women 4·8·7 (extremes 4·7·1—4·10·1). Here the lowest figure is that of the average for Negritoes and Bushmen, showing that the Lapps stand in this respect just above the pigmy races of mankind. Measurements given by other observers correspond with this conclusion. Thus Topinard's mean 5 feet; Von Düben, 5·2 (men), 4·6 (women); Mantegazza, 5 (men), 4·9 (women). Our visitors, as measured by myself, range from 4·10 (Plavna) to 5·4 (Amund J. Anti), figures which agree roughly with those of Dr. Garson.

But assuming that the Lapps are originally of Mongol extraction, and that the strangers in our midst are, as is claimed for them, fair average specimens of the race free from admixture of Norse or other foreign elements, they certainly present some

peculiarities which it seems difficult to account for. These are mainly—

1. Colour of the hair, which ought to be invariably black,⁴ but which is found to be brown, and in the case of the child Anders Anti, even quite fair.
2. Complexion, which ought to show a yellowish tinge, but which is in fact florid—fair and flushed like that of most Norse and English people.
3. Colour of the eye, also brown instead of black.
4. Form of nose, straight and regular rather than short and concave as in the normal Mongol type.

If we attempt to explain the deviations in colour and form of nose by Norse intermixture, the difficulty as regards stature becomes intensified. Instead of falling somewhat below, the height should in fact rise above the normal Mongol standard, because the Scandinavians are about the tallest people in Europe. This solution of the problem cannot therefore be accepted as adequate. The change in complexion and in colour of hair and eye might perhaps be attributed, not so much to contact with European races as to natural evolution of type gradually brought about during long seclusion in a changed environment. We are warned by Linné himself not to attach too much weight to the element of colour, which, amongst other races also is far from constant, and which appears to be peculiarly susceptible to climatic and dietary influences. Now the climate of Scandinavia is much more humid, especially along the Atlantic seaboard subject to the play of the Gulf Stream, and also much milder than that of Central Asia, where the Mongolic type was presumably evolved. Hence it might be argued that if the dry continental climate of that region was conducive to the development of a yellow complexion, the moist climate of the Atlantic coastlands, combined with a change of diet and large consumption of fish, may have tended to develop in the Lapps the same florid complexion that is so characteristic of the Teutonic peoples subject to like influences.⁵

At the same time nobody can attentively study the appearance of the Anti family present in our midst this evening without feeling that it is not merely a question of colour. Not long ago I had the honour of addressing you on the subject of another group of aborigines, the Botocudos from Brazil, whom we had been invited to meet in Piccadilly Hall. Those members of the Institute who have thus had the opportunity of examining and comparing both groups will, I think, agree with me that of the two the Botocudos seemed to have retained a far more decided likeness to the presumable common Mongol stock. There were still conspicuous the distinctly yellow com-

plexion, the broad and somewhat flat features, the large zygomatic arches, the black eyes, and the specially characteristic long black lank hair, traits which have either disappeared or become much softened in our Lapp visitors. Yet it can scarcely be doubted that the migration eastwards from the common Asiatic centre of dispersion to South America must have preceded by many ages the migration westwards to the Scandinavian peninsula. It may therefore be inferred that other influences besides change of scene must have been at work to produce the greater modification of type in the Lapps in a shorter time and in a *milieu* not nearly so far removed as that of the Botocudos from the original home on the Central Asiatic plateau. These influences can only have been that intermingling of different racial elements, which has been incessantly going on throughout the eastern hemisphere since palæolithic times. It is impossible carefully to examine the Anti family without admitting that it has approached the Teutonic precisely in those respects in which it has departed from the Mongolic type. We have here in evidence not merely the peculiar florid complexion, the light hair and large nose, but the very expression of countenance characteristic of the surrounding Norse populations. This is seen especially in Johannes Larsen Anti, and in the two women of the group, who, if photographed according to Mr. Galton's ingenious method, would undoubtedly yield typical Scandinavian features. I would therefore feel inclined to attribute the modification of type more to an infusion of Norse blood than to the changed environment. The stunted stature might then be explained perhaps by the more unfavourable climatic conditions, long Arctic winters, tent life, poor and stinted fare, and so forth. I am supported in this view by Prince Roland Bonaparte, who has recently returned from a long visit to the Mountain Lapps, and who assures me that these communities have nowhere escaped from contact with their Norse neighbours—in fact, that there are no longer anywhere to be found any pure specimens of the Samé race.

The Lapps are described in other respects as strong, of robust constitution, with good muscular development, but bandy-legged and ungainly walkers. The motion, as noticed in their camping ground on Muswell Hill, is a kind of waddle from side to side, conspicuous especially in the men. Their bow legs seem to be due partly to neglect in childhood, partly to their cramped position for hours together in the sledges, and partly perhaps to their cross-legged attitude when sitting, or rather squatting. Like most Asiatics, they use no chairs, but always squat or lie stretched on the ground in postures that sometimes to us seem very uncomfortable.

Lapp and Eskimo—Prehistoric Migrations.

From the Eskimo, with whom they have often been compared, the Lapps are separated by some marked characteristics; of these the chief are—

1. The shape of the head, roundest in the Lapp, almost longest in the Eskimo; respective indices, 83 and 70.
2. Height of skull, the Eskimo ranking amongst the highest (hypsistenocephalic), the Lapp amongst the lowest of any race.
3. Facial proportions, the part subjacent to the superciliary arches being almost the longest in the Eskimo (134 mm.), shortest in the Lapp (109 mm.).

Altogether these two Arctic peoples, if originally one, have become immensely differentiated, the Eskimo remaining far truer to the type of the men of the oldest stone age. Hence Professor Boyd Dawkins, in his "Early Man in Britain," is so far justified in affiliating, or at least comparing the first known inhabitants of Europe—the men of the caves and river drift—not with the Lapps, but with the Eskimo. All the oldest races are everywhere found to be dolichocephalic,⁶ and in Europe these appear to have been succeeded during the prehistoric epoch by brachycephalic peoples.

In the south, along the Mediterranean seaboard, these round-headed tribes were probably the immediate precursors, or even the progenitors, of the Ligures, Siculi, Iberi, and other oldest known inhabitants of Italy, France, and Spain that have left any traces behind them.

In the north, along the shores of the Baltic, these round-headed tribes were in the same way probably the direct progenitors of the Finns, Lapps, Biarmians, and other early representatives of the Mongolic family in Europe.

Then followed between the two, that is, mainly up the Danube Valley into the centre of Europe, the great Aryan irruption, heralded by the Kelts, Itali, Hellenes in the south, by the Teutons, Slavs, and Lithuanians in the north. The Teutons passed at an early date, probably 6,000 or 7,000 years ago, into Scandinavia, where they pressed the Mongolic Finns and Lapps still further north, and where the two races ultimately settled down in their present respective domains. This rough sketch of the later migrations from Asia is in harmony with the actual conditions in the extreme north, where we still find the tall Norsemen (Teutonic Aryans) conterminous with the short Kwains and Lapps (Finnic Mongols).

Historic Retrospect.

But while the Norsemen soon emerged from the savage state, passing rapidly through the stone, bronze, and iron ages, their sluggish northern neighbours have remained almost stationary to the present day. Even the above described divisions into fishing, forest, and mountain Lapps are no proof of recent progress, for they appear to be of long standing, and were already partly recognised by Procopius in the sixth century (*ob.* 560). This writer mentions the tribe of *Skriithiphinoi*, whose characteristic customs, especially the practice of feeding their children with marrow, and suspending the cradles on the branches of trees, show that they were true Lapps and not Finns.⁷ The first component *Skriithi* of this term, usually interpreted to mean "striding," "swift-going,"⁸ must be referred to a Teutonic root, *scrið*=straying, wandering, so that *Skriithiphinoi* would be the nomad or mountain Finns (Lapps) in contradistinction to the fishing or settled Lapps of the coast.

The term was still current amongst the Norse peoples for some centuries after the time of Procopius. Thus the famous Norwegian navigator, Ohthere, the first to round North Cape and explore the Polar waters as far as the White Sea, speaks not only of the "Finns" or Lapps in general, but also of the *Scride-Finns* and *Ter-Finns*, two main divisions answering evidently to the "mountain" and "forest" groups of the Swedes. Ohthere's interesting account of these regions and of their Lapp inhabitants, one of the earliest on record, was verbally communicated by him to his "Hlaforde Ælfrède Cyninge," and by Alfred embodied in his translation of Orosius, Book I, 12, 13.

"To the north," he says, "over the wastes is Cwenland, and to the north-west are the *Scride-Finns*, and to the west the Northmen. Ohthere told his lord, King Alfred, that he dwelt northmost of all Northmen. He said that he dwelt northward on the land by the west sea [the German Ocean]. He said that the land is very long thence to the north; but it is all waste except in a few places where Finns (Lapps) reside for hunting in winter and in summer for fishing in the sea. He said that at a certain time he wished to find how far the land lay right north, or whether any man dwelt north of the waste. Then he went right north near the land; he had all the way the waste land on the right and the wide sea on the left for three days. . . . He had not before met with any inhabited land since he came from his own home, but the land was uninhabited all the way on his right, save by fishermen, fowlers, and hunters, and they were all Finns (and *þæt wæron ealle Finnas*); and there was always a wide sea on his left. The Beormas [Biarrians,

Permians] had very well peopled their land, but they durst not come upon it. The land of the *Ter-Finns* (*Terfinna* land) was all waste save where hunters, fishers, or fowlers encamped. . . . The Finns and the Beornas, as it seemed to him, spoke nearly the same language. He chiefly went thither, in addition to seeing the land, on account of the horse-whales (walruses), because they have very good bone in their teeth; of these teeth they brought some to the king, and their hides are very good for ship-ropes. . . . He [Ohthere] was a very wealthy man in those possessions in which their wealth consists, that is, in the wilder animals. He had, moreover, when he came to the king, six hundred tame deer of his own breeding. They call these reindeer (*hránas*); of these, six were decoy-deer, which are very valuable among Finns, because with them they take the wild deer. . . . Their revenue is chiefly in the tribute that the Finns pay them, which is in skins of animals, feathers of birds, whalebone, and ship-ropes made from the whale's hide and from the seal's."

The component *Ter* in the above-mentioned expression *Ter-Finns*, has not been explained, but it would seem connected with a root meaning *tree*, so that these *Ter-Finns* would correspond with the "Forest Lapps" of Sweden and Russia. They were conterminous, as they still are, with the Kwains (*Cwens*), a branch of the true Finns also mentioned by Alfred, whose territory (*Cwenaland*) stretched away to the White Sea, which from them took the name of *Cwen Sæ*. Specially noteworthy is the remark that the Beornas and Lapps seemed to speak nearly the same language, for the Beornas—later Biarmians, now Permians—are themselves a collateral branch of the common Finnish stock, and to this day speak a Finnish dialect closely related to *Siryānian*, and betraying distinct affinities to Lapp.

Such then were the Lapps, fishers and fowlers and hunters ("fisceran and fugeleran and huntan"), when this circumstantial account of the race was communicated by the Norwegian seafarer to King Alfred just a thousand years ago. Such they still were when again visited by an English mariner, the Captain of the "*Searchthrift*," some six hundred years later. The only change that had taken place was one of nomenclature; for when on his voyage of discovery in the northern waters this explorer called at the spot where now is *Vardöhuus*, at the entrance of *Varanger Fjord*, he no longer heard of *Skride-Finns* or of *Ter-Finns*, or of Finns at all, but only of *Lappia* and *Lappians*, the name by which they were henceforth to be known to the English-speaking world. But whether Finns or Lapps, they were still the same rude unprogressive nomads as of old, "a wild people which neither know God nor yet good order. And these people

live in tents made of deerskins, and they have no certain habitations, but continue in herds [hordes?] and companies of a hundred or two hundred. And they are a people of small stature, and are clothed in deerskins, and drink nothing but water, and eat no bread, but flesh all raw."

Since that time there have certainly been changes, but not always for the best. It may be no longer true that they "know neither God nor good order," but they have also unfortunately acquired a decided taste for much stronger drinks than "water." But in most other respects little change has been made in their social life, so that in the following century, the poet of the Seasons is still able to describe them as a rude and primitive people, who

"ask no more than simple nature gives.
They love their mountains and enjoy their storms;
No false desires, no pride-created wants
Disturb the peaceful current of their time,
And through the restless ever-tortured maze
Of pleasure or ambition bid it rage.
Their reindeer form their riches. These their tents,
Their robes, their beds, and all their homely wealth
Supply, their wholesome fare and cheerful cups."

Social Life—The Reindeer.

In the last lines of this passage is summed up the whole social system of the nomad Lapp, which may be said to begin and end with the reindeer. Certainly this animal is as indispensable to his well-being, and to his very existence, as is the dog to the Eskimo or the camel to the Bedouin of the wilderness. Restricting our observations to the Mountain Lapps, who alone represent the primitive culture of the race, of them it may be truly said that their whole life is devoted to the care of their reindeer herds, which supply them with food, raiment, bedding, most of their household implements, and means of locomotion. Every part of the animal is turned to some useful purpose, the flesh being mostly dried and converted into jerked meat, the offal boiled and eaten fresh like certain parts of the pig killed in English farmsteads, the blood, formerly by all still by the poor, congealed, pulverised and kneaded into cakes or used as a soup, the milk taken fresh or frozen in a slightly fermented state, or made into cheese for the winter store. The skin covers the tent floor, the bed and the body, while the sinews make excellent cordage, and the bones after extraction of the marrow are carved into many useful and fanciful articles, such as spoons, forks, knife-handles, and the like.

Like the domestic animals of all peoples at a low stage of culture, the reindeer are subject to a good deal of rough usage, and the method of breaking in the young animals is not un-

attended with cruelty. Here is how the operation is performed by Jompa, one of the heroes in Professor Friis' "*Laila, or Sketches from Finmarken*": "The deer had already undergone its first lesson according to Jompa's method, which consisted in fastening it with a long rope or reins leading to the top of a slender and pliant birch-tree and leaving it to struggle at its will. The birch-tree bent as the deer sprang forward, slipping about and falling in its attempts to get free. But the tree was the stronger of the two, and it gradually happened to the deer as it does to a hooked salmon at the hands of a skilful angler. In the end it had to yield and submit to harness and reins. At first the animal is frightened at the sledge when it sees it following. It seems to think that it is a wolf or some other beast of prey, but gradually it loses its fear and the traces are then shortened. Later it would be harnessed to a sledge with some slight load in a line with tame deer, which it is thus compelled to accompany" (p. 36).

This rough handling has been much noticed at the encampment on Muswell Hill, where it may be mentioned that since its arrival in the early spring the herd has been increased by two, the first born in England probably since the stone age.

On their native fjelds these herds range in number from about a hundred, a poor man's portion, to two thousand and upwards. Dr. Sophus Tromholt indeed tells us that he lately knew one man who had as many as eight thousand ("*Under the Rays of the Aurora Borealis*"). But in Norway, where the pastures are inferior and the winter lichens less abundant, the herds are rarely found to number more than a thousand. Here they even appear to be slowly diminishing, straying away beyond the frontiers into Swedish and Russian Lapland. In such cases a fine or poundage of a tenth and even more is exacted, thus entailing constant losses on the Norwegian herdsmen.

Of these nomad pastors there are two classes: 1. Those who always stay with their herds throughout the year, merely moving about from their summer to their winter pastures; 2. Those who every year in summer from May to August migrate to the coast where they take to fishing. In their absence the herds run almost wild, and on their return are with difficulty again brought within the fold. Those so collected are distributed to their rightful owners, being identified by means of marks branded or cut on the ear of each animal soon after birth.

Formerly much more numerous herds were owned in Norway, and Friis assigns as many as "3,000 or 4,000 reindeer" to his hero Aslak Logje, described as "the richest Mountain Finn in Finmarken." But, it is added, this was "many years ago" ("*Laila*," p. 29). It is curious to compare these figures with the above quoted statement of Alfred's Ohthere, also "a very wealthy

man," who had "six hundred tame deer of his own breeding." It is evident from this passage that in those days the Norsemen as well as the Lapps herded deer. There is even reason to suppose that the latter learnt the art of taming them from their more intelligent neighbours. Were this point established, it would show that the Lapps must have arrived in the country unaccompanied by their herds, and there would be an end of the theory already rejected on other grounds, that after glacial times they gradually withdrew with their animals from Central Europe to their present homes.

The Lapp Dog, Sledge, and Snowshoes.

To help in tending the herds they possess a fine breed of dogs, two of whom have accompanied our visitors this evening. They appear to be of a somewhat vulpine type, intermediate perhaps between the Eskimo and the so-called "Pomeranian" stock. Sharp-nosed, keen-scented, bushy-tailed, with a thick soft fur, especially on shoulders and neck, this variety is distinguished by great fleetness and unwearied activity, and scarcely yields to the Scotch collie itself in intelligence and devotion to its master. It is never, however, harnessed, as is the Eskimo dog, to the sledge, its almost exclusive duty being to tend the herds, which but for its indispensable aid could at times scarcely be kept together.

Of the sledges there are three varieties—

1. The *Kerres*, usually 7 feet by 2, quite open, in which the traveller sits as in a canoe strapped round with reindeer skin.
2. The *Läkkek*, for stores, wares, utensils, completely decked over as a protection against the elements.
3. The *Pulkan* (*Pulk* of English writers), the sledge proper, used on all important occasions, more solidly built than the others; half-decked or half-covered with sealskin. The driver of the *Pulkan* often takes five or six of the *Läkkek*s in tow, thus forming a so-called "*Raide*," or caravan, by which he is able economically to convey considerable quantities of goods across country to market.

Long journeys are performed not only with the sledges, but also with the snowshoes, which are from 6 to 7 feet long, but only $3\frac{1}{2}$ to 4 inches wide, and admirably adapted for rapid locomotion over hard and smooth snowy surfaces. With these attached to a reindeer by a rope or guiding string held in the left and the reins in the right hand, they easily cover distances of seventy or

eighty miles a day. Even without the reindeer, the snowshoes will carry them, especially down inclines, at almost railway speed, and on the level at the rate of seven or eight miles an hour. They are thus able to move about with great rapidity in winter, and Gustav von Güben, author of the best work on the Lapps, tells us that in the winter of 1866-7 a well-known Lapp woman paid him an unexpected visit in Stockholm at a time when he supposed she was away amongst the snows of her native place in the Wilhelmina district, Lappmarken. When asked how and whence she came so far south, her answer was that being with the herd in the neighbourhood of Hernösand, and having something to do for the school, she thought she would just take the opportunity to slide down to Stockholm, the distance between the two places being 46 Swedish, or about 300 English, miles.

With the snowshoes a distance of 120 and even 130 miles is sometimes covered in twenty-four hours, the traveller stopping only for a few minutes now and then for refreshment. The same distance may be got over with a sledge in eighteen or twenty hours; and, altogether, the average speed by these two means of conveyance is nearly the same. Neither the sledge nor the snowshoes can be used effectively, if at all, in summer, which, however, seldom lasts for more than three months in the year. During this season locomotion is very slow, and in their yearly migrations coastwards the nomad Lapps move in short stages of little over eight or ten miles a day. But then they have to carry everything with them, tents, tent-poles, household utensils, provisions, chests of clothes, besides the children and invalids. So laborious are these journeys that the sick and helpless have at times to be abandoned by the wayside or in some wretched hovel, supplied with what little food there may be to spare, and left to take their chance to recover and follow on. Otherwise a lingering death is their inevitable fate. Formerly the more summary process was adopted of putting them out of their misery by a blow on the head.

Mental Qualities—Domestic Life.

In respect of their moral qualities I find that, with a few inevitable drawbacks, the Lapps compare, on the whole, not unfavourably with their Norse, Finn, and Muscovite neighbours. Except when depressed by religious gloom, to which the "revivals" occasionally give rise, they are of a cheerful temperament, fond of gossip, very hospitable, and much given to merry meetings and family gatherings, at which the feelings, whether of joy or sorrow, find ready vent in copious weeping. At these gatherings spirits also unfortunately flow somewhat too freely,

so that the Lapps, formerly one of the most temperate of peoples, who drank "nothing but water," have earned a too well-founded reputation for hard drinking. Intemperance has in fact become their besetting sin. Of Jompa, one of the already mentioned characters in "*Laila*," we are told that he "drank whenever and wherever he could get spirits, and to such an extent that when drunk he remained where he fell, in the house or in the open air in the snow and cold. Indeed, sometimes when he woke up after an orgie his long unkempt hair was frozen so fast in the snow and ice that he had to cut it loose with his knife" (p. 33).

Although *finkel*, the spirit most consumed on the coast, is a fiery extract that has been compared by Mr. Vincent to "a mixture of nitroglycerine and train-oil," the people have the reputation of being excellent judges of the wares they purchase from their neighbours. They prefer genuine Mocha, for instance, to the Brazilian coffee generally consumed in Norway, and can readily discriminate, I am told, between a bottle of good Irish malt and "British brandy."

In other respects they are described as extremely peaceful, possessing no offensive weapons, carrying on no inter-tribal feuds, kind, good-natured, and, except in Russia, strictly honest and trustworthy. The women are not required to do all the hard work, and are treated on a footing of perfect equality, while the children are, on the whole, rather "spoilt with kindness." It must be confessed, however, that the men are naturally of a somewhat indolent disposition, if not downright lazy, and disinclined to manual labour. Yet I have noticed that those now amongst us show no objection to carrying about the cradle and rocking the baby to sleep when restless.

The cradle itself is a very ingenious structure, admirably suited for its purpose under the ordinary circumstances of Lapp existence. "These cradles," Friis tells us, "are hollowed out of a log, and have a hood which protects the child's head. From this hood down to the end a light network of thongs or cord is stretched over the child, and over this net a handkerchief or other covering can be spread in such a manner that the child can lie in complete shelter without hindrance. A strong strap is fastened from one end of the cradle to the other, by means of which it can be slung on the back or set to swing from the branch of a tree. It may be thrown on the ground and rolled about without injury to the child, and it will moreover keep out cold of 20° below zero" (*op. cit.*, p. 16).

The family consists of from one to five or six, say an average of about three children. But infant mortality is high, so that there is little natural increase, especially among the Mountain Lapps.

In civil and criminal matters all are subject to the jurisdiction of the local Norwegian, Swedish, and Russian "sherifs" or magistrates. Strictly domestic affairs, such as marriages, distribution of property, settlement of "family quarrels," are amicably arranged by the heads of families and most respected members of the community. The tribal organisation has long ceased to exist, the only reminiscence of it being the mark or "totem" given to each Lapp at birth and stamped or branded on all his effects, for the purpose of identification.

A peculiarity of the race is the absence of the musical faculty, the statements of travellers that they do not or cannot sing being on the whole borne out by the results of careful inquiry. None of our visitors sing or indulge in any melody beyond a monotonous hum. The sense of harmony is in fact restricted to a certain declamatory or oratorical tone adopted by the "story-tellers," as they recite the national myths or legends to the family groups around the tent fire during the long winter nights.

These fires are always kindled in the middle of the tent in a circle of stones, above which is suspended the family pot from a stout stick, which also serves to strengthen the framework of the tent. This is no longer covered with reindeer skins, as formerly, but only with coarse woollen fabrics or canvas, which in very cold weather is doubled. But even so, it is surprising how any human beings can pass the winter in the polar latitudes under such slight shelter as is thus provided against the intensely cold Lapland weather.

But the race is extremely robust, inured to all manner of hardships, frugal except in the matter of drink, and very thrifty. Their foresight is carried even beyond the grave, and it is no uncommon practice to bury or hide away money and other treasure for use, not only in this, but also in after life. A Mountain Lapp, once asked why he had disposed of his money in this way, instead of investing or putting it out to interest, replied, "To prevent it from falling into other hands after my death; for in that case what would I have to live upon in the other world?" This is probably the true explanation of the statement sometimes made by observers that, like the Fuegians, they are apt to forget the place where they have deposited their stores. No Lapp would be at all likely to forget a matter of this sort, and the supposed or assumed forgetfulness simply means that they have anticipated the scriptural advice to lay up for themselves "treasure in heaven, where neither dust nor moth doth consume, nor thieves break through and steal." The practice is doubtless a reminiscence of pagan times, when the Lapps, like other savage peoples, believed that

the after-life was merely a continuation of the present material existence. We find this belief everywhere illustrated by the custom of depositing the good things of this world in the graves of the departed. But the Lapps appear to be the only people who took the wise precaution to do this for themselves, and not trust after they were gone to the generosity or forethought of their surviving kindred.

Religion Past and Present.

In those pre-Christian times they were nature-worshippers and Shamanists, who peopled the heavens above and the regions below with a whole hierarchy of supernatural beings. First came the deities who had their abode in the starry regions above the sky, impassive spirits too far removed to hear our prayers or heed our wants; then those dwelling in the azure firmament, and below them the aerial beings in the circumambient spaces near the earth, and lastly the underground demons, more than the others to be respected and propitiated, because more dangerous and more evilly disposed. The sun also, and especially the moon, were held in high honour, and during lunar eclipses spears, afterwards replaced by firearms, were discharged at the devouring dragon, as amongst the Chinese, the Laos, Botocudos, and so many other worshippers of natural phenomena. Of the good spirits, the chief was Jupmel (originally Jumela), of the bad, Perkel. A more distinct personification was the thunder-god, Atja, that is, the "great father." Hence this word still means not only *father*, but also *thunder*, which, like other powers of nature, is conceived as a living being.

As amongst the Mongolians and other east Asiatic peoples, Shamanist rites were also practised, in which the magic drum and "rune-trees" played a great part. These rune-trees, made of pine or birch bark, inscribed with figures of men, animals, or gods, were consulted on all important matters, and the interpretation of the mysterious signs was "the great art and highest wisdom." The Shaman was all-powerful, for he alone could mediate between the people and their gods. His voice alone could reach the ears of the spirits and make peace offerings acceptable to them.

The Shaman was essentially a "medicine-man" or wizard, and out of Shamanism naturally grew a highly developed system of magic art, famed even beyond the confines of the Lapp domain. It is recorded that foreign potentates sent to consult the oracles delivered by these magicians, and in England the expression "Lapland witches" became proverbial, although it appears that there were never any witches, but only wizards,

in Lapland. They were skilled in the use of the divining drum, which was of oval shape, 1 to 4 feet long, and hung all round with charms, tufts of wool, bones, teeth, claws, and the like. The wizards had also a very powerful spell for raising storms, thus described by quaint old Richard Eden: "They tie three knots on a string hanging at a whip. When they loose one of these they raise tolerable winds; when they loose another the wind is more vehement; but by loosing the third they raise plain tempests, as in old time they were accustomed to raise thunder and lightning."

But all this has long passed away, and at all events since the beginning of the present century the whole nation has been Christian—Lutherans in Scandinavia, "Orthodox Greek" in Russia. With heathendom polygamy and polyandria have also ceased to be practised, and indeed would not now be tolerated by the civil authorities. Hence Mr. Frank Vincent must have been the victim of some strange hallucination when he discovered these usages still surviving among the Lapps recently visited by him. "Polygamy," he says in one place, "is still in vogue, and marriageable girls are often sold by their parents. The daughter of a rich man costs a hundred reindeer; that of a poor man about twenty" ("Norsk, Lapp, and Finn," p. 134). And elsewhere we are assured that one of the causes of the dwindling of the Lapp race is "the practice of polyandry" (p. 152). These statements I am in a position to say are absolutely groundless, although marriage is certainly still looked upon as largely a matter of business rather than a religious ceremony, as might be expected from the thrifty habits of the people.

Traces even survive of the times when abduction, originally real, afterwards feigned, formed an essential part of the marriage rites. Thus of Laila, the heroine of Friis' tale, we are told that she resisted and would not put on the wedding-ring, which was in accordance with custom. "For a Finn [Lapp] bride is expected to resist when they come to dress her. She ought to weep and lament and declare that she does not wish to be married; but at last she allows herself to be led to the altar."

"It happened once," he goes on to say, "that a bride when asked by the pastor at the altar if she would like N. N. to be her wedded husband, answered No! 'Well, then, I cannot marry you,' said the pastor. 'Oh,' said the bride, 'I expected you to put the question again'" (p. 233).

All this is but the faint echo of the days when they were carried off forcibly and shouted No! in right earnest. Then came the stage when they pretended to resist, and so on to the present time, when some are still found who expect to be asked twice.

Christianity was first introduced about the year 1714 among the Norwegian Lapps by the Danish missionary, Thomas von Westen, who is regarded as the apostle of the nation. Since then missions have everywhere been kept up, and with the spread of the Gospel education also has been gradually diffused among the people. In Russia they are certainly no better instructed than their neighbours. But in Norway and Sweden nearly all can at least read and write. All the adult members of the Anti group know their letters well, as I have been able to satisfy myself by a practical test. But the Mountain Lapps appear to care very little for "scholarship," and, except the rising generation, none amongst them turn their proficiency to any useful purpose.

Language.

They have, however, almost universally preserved the national speech, notwithstanding the great efforts formerly made by the Swedish and Norwegian governments to force the Scandinavian tongues upon them. "Hereafter both you and your children must learn Norwegian," says Pastor Hard Hjorth, one of the characters in "Laila." "Why should we learn Norwegian?" retorts his interlocutor Logje; "we are satisfied with our own language." "Because Norwegian is the better, the more copious, and the more useful tongue?" "Norwegian is not better for us and for our mode of life. Your language is a bad one when one has to talk of reindeer, of hill and valley, of the light of day, and of the darkness of night, and of all that pertains to our ordinary life. You have not one word for our ten about reindeer and many other things.¹⁰ Is such a language rich? No! it is a poor one for us."

And so thought Logje's fellow-countrymen generally, who have continued faithful to their mother-tongue, although more than once officially suppressed and although at one time children were enjoined to receive religious instruction exclusively in Norwegian.

In its structure Lapp is clearly a member of the Finno-Tataric linguistic family closely allied on the one hand to Finnish, on the other to the Mordvinian, of the Volga basin, and the Samoyede, of the Siberian tundras. But from remote times its vocabulary has been largely affected, especially by Norse elements. By a critical study of these elements Von Güben has endeavoured to determine the state of Lapp culture when the race first came in contact with the Scandinavian peoples. Thus he finds that at that time the Lapps must have been pure nomads, with no knowledge of agriculture, of the metals, of

tanning, or even of stock-breeding or reindeer farming, in the strict sense of the expression; for all terms connected with husbandry, metal-working, the names of the metals, and even of milk, are of Norse derivation.

As in most Uralo-Altaic tongues, verbal forms are very numerous, Lappish in this respect rivalling even Finnish and Turkish themselves. Besides dual and plural personal endings, there are transitives, intransitives, causals, diminutives, inchoatives, passives, negatives, and many others, all formed by agglutination upon a single unmodified root. Thus: *laitet* = to guide; *laiteſtet* = to guide a little; *laitekätet* = to begin to guide; *laitetallet* = to be guided, and so on.

A curious feature is the inflexion of adverbs and other particles mostly undeclinable in the Aryan family. Thus: *kukke* = long, far; *kukket* = from afar; *kukkas* = far away, as in *wuoyeti kukkas muste* = go far away from me. All particles are suffixed to the root, so that there are no prepositions, but only agglutinated postpositions, as in *mokum*, *tokum*, *sokum*, corresponding in sense, and, curiously enough, in sound, to the Latin *meum*, *tecum*, *secum*. This is one of those singular coincidences which etymologists of the old school are so fond of seizing upon, although this particular case seems to have hitherto escaped their notice.

The language has been reduced to writing by the missionaries; but in it little has hitherto been composed except school books, devotional and religious works, besides some popular tales, songs, and folklore taken down from the mouth of the people by Grönland and other collectors.

Lappish is spoken with considerable dialectic variety in Russia, Sweden, and Norway. Even in the latter country the Finmarken dialect differs so much from that of Rörös that the inhabitants of the two districts can hardly understand each other. But the languages of the more cultured nations are everywhere encroaching on the domain of the national speech, and the process is naturally stimulated by the spread of education. Both in Norway and Sweden civilised Lapps are already found, who feel ashamed of their ruder kindred, and thus must inevitably become absorbed in the surrounding Norse populations.

Prospects.

Thus it requires no great gift of prophecy to foretell the fate in store for these kindly and inoffensive nomads. Primitive peoples who have lagged behind in the race become extinct or disappear, either by extermination, by slow decay, or by absorption. There is no danger of their being exterminated, as were

the Tasmanians during the first half of the present century; for the Lapps are now treated with perfect justice, and by their respective governments protected from unscrupulous speculators. Nor is it at all likely that they will die out through inanition, as it were, like the Ahts of Vancouver's Island, and so many inhabitants of Polynesia; for they are a hardy and healthy race, free from any destructive endemics, and as full of vitality as their neighbours.

But their grazing-grounds are becoming slowly exhausted; their domain is being encroached upon by the surrounding populations, whose speech and usages they are adopting; they are being steadily crowded out, or driven to exchange their nomad habits for a settled life. The sedentary far outnumber the wandering communities, and a sedentary Lapp is already half a Norseman. Once they take to agricultural pursuits, the process of assimilation goes on apace, and must be continued until the whole race has been completely merged in the more numerous and progressive Scandinavian populations. With it must also disappear the reindeer, that most remarkable survival from pleistocene times, when it roamed over Central Europe in company with the cave bear and *Elephas primigenius*, the contemporary, if not already the associate, of the men of the stone age.

NOTES.

¹ In fact in the mouth of the people themselves *Lapp* appears to be always used as a term of contempt or reproach. Hence it is not at all probable that it is of native origin. Otherwise it might possibly be connected with the Lappish root *Lappek*, which seems to have escaped the notice of commentators. This word means *swamp*, or *fen*, so that *Lapp* might still be taken as an alternative for *Samé*, and *Lappe(k)-gunda* would be equivalent to "Fin-land" (*Fen-land*).

² Dr. P. A. Possart brings them even much farther south, and asserts with some old authorities that "Lappen als Grenzvolk, welches das Wort auch bedeutet, hat es unter Finnen und neben Finnen so südlich gegeben wie in Esthland [Esthonia], nachher in Finnland von dem Innern des finnischen Busens an bis zum Eismeere" (Lappländische Gram. Einleitung IV). It is even pretended by some authorities that the *Fenni* of Tacitus (*Germania*, 46) were really Lapps, and the further back inquiry is pushed the more difficult it becomes to distinguish between the two peoples, a fact which itself points at their primordial unity.

³ "Aus dem obern Finnland sind sie, besonders durch die Tawaster [Tavastians], seit noch nicht entfernter Zeit verdrängt worden; und dies ist jene Vertreibung aus Finnland, deren sich die Lappländer selbst erinnern" (Possart, *loc. cit.*).

⁴ And which appears to have been normally black in the time of Linné, who briefly describes the Lapps as characterised by "capillis nigris, brevibus, rectis." The hair is still mostly "short and straight," but far from uniformly "black."

⁵ It is noteworthy, however, that, under various names, such as Wu-sun, U-sun, Hiong-nu, &c., the Chinese records speak of ancient races on their northern frontier as characterised by fair complexion, "red" hair, "green" eyes, and tall stature. These races are identified by some with the "Chudes," a collective term applied by the Russians to all the Finnish peoples, who might

consequently have acquired such traits even before their arrival in Europe. A florid complexion is still also common enough among the Manchus, Koreans, Rui-Kiu Islanders, Ainos and other north-eastern Asiatic peoples, a circumstance which has given rise to the theory advocated by De Quatrefages and others of an earlier diffusion of the Caucasian stock throughout most of the Asiatic Continent. But this is one of the obscure points of Asiatic ethnology needing further elucidation, and which cannot here be discussed with advantage.

⁶ This statement, which anthropologists were slow to accept, has received fresh confirmation from the discovery of a fossil skeleton at Castenedolo, six miles south-east of Brescia, by Professor Ragazzoni, on February 16th, 1880, and recently examined by Professor G. Serpi, who pronounces the type to be distinctly human and dolichocephalic with index 71.97 ("L'Uomo terziario in Lombardia," reprinted from "L'Archivio per l'Antropologia," xiv, 3, 1884).

⁷ The passage, which is of great historic interest, occurs in the "Gothic Wars," Book II, 15: *Τῶν δὲ ἰδρυμένων ἐν-Θούλῃ βαρβάρων ἐν μόνον ἔθνος, οἱ Σκριθίφιννοι, θηριώδη τινὰ βιοτὴν ἔχουσιν. . . . Οὐ γὰρ σιτίζονται Σκριθίφιννοι παῖδια γυναικῶν γαλακτὶ οὐδὲ μητέρων ἀπτονται τιθῶν, ἀλλὰ ζῶων τῶν ἀλισκομένων τοῖς μυελοῖς ἐκτρέφονται μόνοις. ἐπειδὴν οὖν γυνὴ τάχιστα τέκοι, δέρματι το βρέφος ἐμβαλλομένη κρεμᾷ μὲν εὐθὺς ἐπὶ δένδρον τινός, &c.* It is noteworthy that these "Skrithiphinnoi" are by Procopius here placed in his "Thule," elsewhere said to be a vast "island" far larger than Britain, a description obviously applicable only to the Scandinavian peninsula at that time (sixth century) still supposed to be entirely surrounded by water.

⁸ Thus in one of the Sagas quoted by Von Güben a Norse hero exclaims, *Skríða Kann eg á skíðum*, "Stride can I on skates."

⁹ "History of Travel," 1577, p. 284; spelling modernised.

¹⁰ Thus besides the general terms *páto*, *sarwa*, *herke*, &c., for reindeer, *luotoot* is the young fawn, *mese* the yearling, *orrek*, *vuopperes*, *kállotes*, *kosetes*, *makanex*, *nammo-lappeye*, the animal in its 2nd, 3rd, 4th, 5th, 6th, and 7th year respectively. There occur 20 words for ice, 11 for cold, 41 for snow in all its forms, 26 verbs to express freezing and thawing, and so on.

The following paper was then read by the author:—

On the PHYSICAL CHARACTERISTICS of the LAPPS. By J. G. GARSON, M.D., F.Z.S., M.A.I.; Lecturer on Comparative Anatomy, Charing Cross Hospital; Royal College of Surgeons of England.

THE Lapps examined by me in conjunction with Professor Keane at the Alexandra Palace were three males and two females. Two of the males were adults, their ages being forty-four and thirty-one years respectively; the third was a young man of twenty years. The two females were adults. All of them were fairly well developed, the elder woman being the sparest of the group.

The colour of the eyes differs considerably, being brown with a greenish tinge in the two adult males, gray in the youth, and brown in the two women, those of the elder woman being of a darker shade than those of the younger.

The skin of the face is brownish, as is also that of the hands,

but this arises from exposure, as that of the rest of the body is white, differing in no respect from that of the working classes in this country, save that it is not kept so clean, it being a rare thing, I am informed, for the Lapps to wash themselves.

The colour of the hair in the males differs from that of the females, being dark brown in the former and light brown in the latter. In all cases it is quite straight, and regularly distributed over the scalp.

The examination of the various measurements was made under very disadvantageous circumstances; indeed many measurements I wished to make could not be obtained at all. The following are the results of those I was able to make. In stature there is a good deal of variation among the men, one being comparatively tall, while the other two are short. The average stature of the three is 1,562 mm. = 5 feet 1½ inches. The tallest man measured 1,655 mm. (5 feet 5·2 inches) in height, while the shortest was only 1,480 mm. (4 feet 10·3 inches). The women, however, are more of a uniform height, being respectively 1,500 (4 feet 11 inches) and 1,520 mm. (5 feet). These measurements were made with boots on the feet, for which, as far as I could calculate, 2·5 cm. (1 inch) in the case of the men, and 1·5 cm. (½ inch) in the women, must be deducted to obtain the actual stature. According to Horch¹ the average height of male Lapps is 1,500 mm. (4 feet 11 inches), which fairly agrees with the average of those before us, when the thickness of the sole of the boot is allowed for. The shortness of stature seems to be due to the shortness of the lower limbs, which are short in proportion to the size of the trunk, as compared to what obtains in Europeans generally. The average difference between the height of the males and females is about 40 mm., or about one-third what it is between English men and women.²

The span of the arms in all instances exceeds the height of the body. The span of the arms in the tall man considerably exceeds that of the others, and is also much larger in proportion to his height.

The length of the forearm and hand, from the end of the olecranon to the tip of the middle finger, is much the same both in the males and females, except the tall male, who has a considerably longer forearm than the others, it being in his case 470 mm., having a mean length in the others of 420 mm.

The form of the head is very brachycephalic, or short from before backwards, in proportion to its breadth, the cephalic index, or the proportion of breadth to length, averaging 90·2 in the males, and 87·0 in the females. Comparing these averages in

¹ Report Brit. Assoc. (1883), p. 271.

² Ibid. (1883), p. 260.

the living with those in the skulls, we find that the cephalic index of seven male skulls in the College of Surgeons Museum is 83·4, and of forty skulls 80·1. The results obtainable from these two sets of measurements agree, in that they indicate the Lapps to be a very brachycephalic race. The points of maximum breadth are situated far back comparatively to the length of the skull, while the forehead is narrow, giving the cranium a markedly wedge-shaped appearance, a condition which is readily observed in the living people before us. The size of the skull is large, as is indicated by its capacity, which in the crania before us average 1,570 cc., measured with mustard seed according to Professor Flower's method, which is about 30 cc. less than what their actual capacity probably is.

The chin is narrow and pointed, especially in the males, while the malar bones stand out prominently. In the skulls the prominence of the malars is also observable, but the pointedness of the chin is less marked. The flatness of the face so characteristic of the pure Mongolians is little observable in the people before us. The transverse axis of the palpebral opening is almost horizontal, as in Europeans generally, so that in this respect they do not possess the well-marked Mongolic feature of oblique eyes. There is no vertical band masking the internal commissure of the eyes as in the Mongols; the eyebrows extend over the eyes as in Europeans. The orbital index of the skulls average—males 83·8, females 82·8. The facial index, or the length of the face in proportion to its breadth, averages 77·3 in the males and 76·8 in the females, while in the skulls it is 84·2 in the former, 86·3 in the latter.

On an examination of the skulls we find that though the zygomatic fossæ are normally deep, the zygomatic arches lose their usual appearance of prominence owing to the breadth of the brain case above. Indeed, the Lapp skulls I have examined are without exception *cryptozygos*. The fronto-zygomatic index of the five males averages 93·4, and of the four females 92·9, which is remarkable, as in a long list of this index in various races given by Topinard, only in the Eskimo does the index in the males exceed that of the females. The gonio-zygomatic index of the males averages 78·3, and of the females 80·6, which shows the breadth of the lower portion of the face of the woman to be greater than that of the man. This character, when taken in conjunction with the facial index, which is lower in the woman than in the males, shows that the face of the former is rounder than that of the latter. This is well illustrated in the living specimens before us.

The nasal index is 73·5 in the males, and 68·2 in the females, while in the skulls it is 47·1 in the former, and 49·4 in the

latter. It may be observed that in this measurement especially the same accuracy of observation cannot be obtained in the living as in the skull, where the points of measurement are easily and accurately defined. Indeed, the measurements on the living and on the skull can seldom be directly compared with one another. The most that can be done is to compare general results of each set of measurements, to ascertain whether they corroborate each other in indicating certain characters, there being no definite relation between them.

The chief characters of the Lapps may be briefly stated to be—Brachycephalic, Brachyprosopic, Mesognathous, Leptorhine, Meso-konchus, Cryptozygos, and Megacephalic.

Table of Measurements of Lapps.

Name	Ole Nilsen.	Johansen Antl.	Larsen.	...	...	Ellen.	Maid.	
Age	44	31	20			Circa 40	C. 20	
Sex	♂	♂	♂			♀	♀	
Condition	medium	medium	medium			thin	medium	
Colour of eyes	brownish green	brownish green	grey			dark brown	brown	
“ of hair	brown	almost black	dark brown			light brown	light brown	
“ of skin	white	white	white			white	white	
Character of hair	straight	straight	straight			straight	straight	
Profile of nose	No. 1	No. 1	No. 1			No. 1	No. 1	
Maximum length of head	174	184	164	174	181.3	162	176	169
Maximum breadth of head	156	160	154	156.7	151	144	150	147
Cephalic index	89.6	86.9	93.9	90.9	83.4	88.9	85.2	87
Bizygomatic breadth	142	146	134	141	136.6	132	135	133.5
Minimum frontal breadth	110	104	101	105	98	101	102	101.5
External bi-orbital breadth	124	122	110	118.3	106	110	110	110
Bigoniac breadth	100	108	104	104	107	100	98	99
Height of face (Kolmann's)	108	116	104	109.3	115	104	100	102
Facial index	76.9	79.4	77.6	77.3	75.7	78.8	74.1	76.7
Height of nose	46	56	46	49.3	51	42	46	44
Breadth of nose	39	37	32	36	23.7	28	32	30
Nasal index	84.8	66.1	69.6	73.5	47.1	66.7	69.6	68.2
Total—								
Height of body	1,480	1,655	1,550	1,562	...	1,500	1,520	1,510
Length of fore-arm and hand	427	470	420	439	...	420	400	410
Span of arms	1,520	1,770	1,580	1,623	...	1,579	1,535	1,567

The following paper was read:—

THE ESKIMO DIALECTS *as serving to determine the Relationship between the Eskimo Tribes.* By Dr. H. RINK, *Knight of the Order of Dannebrog, etc.*

IN April, 1871, I received a letter from the Secretary of the Ethnological Society, then lately united with the Anthropological Society, in which I was invited to communicate to the newly-formed Institute a paper on the Eskimo, in accordance with a promise which I had given. I do not know how I failed to keep this promise, unless that in 1875 I published an English edition of my "*Tales and Traditions of the Eskimo*,"¹ when a communication of the kind suggested was in some measure rendered useless. But since that time I have advanced in my Eskimo studies from the traditions to the language, and have endeavoured to discover whether the dialects of the different Eskimo tribes could not lead to some conclusions regarding their mutual relationship, their origin, and ancient migrations. I am far from having finished this investigation, but as I have just now had an opportunity of revising the material which I have collected, I take the liberty to lay before the Institute some of my preliminary results.

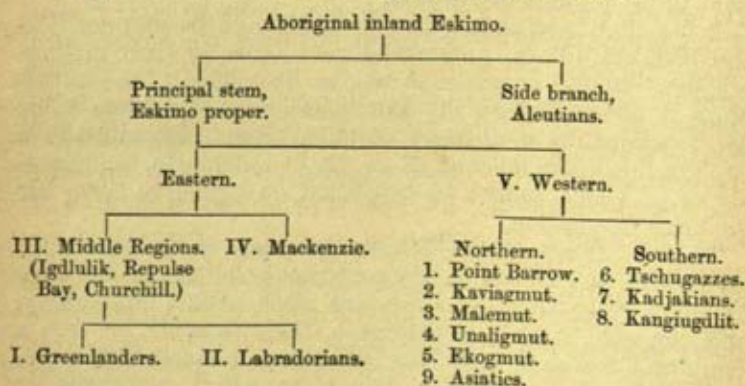
It has often been stated that the Eskimo of the extreme East and West are able to understand each other in their mother-tongues. If this assertion is not to be taken in the strictest sense, I almost believe it. But considering that these tribes are separated by a distance of more than 3,000 miles in a straight line, there must at all events be differences, the examination of which cannot be neglected on trying to solve the problems in question.

The peculiarity of the Eskimo language as polysynthetic, consists, as well known, in the construction of nouns and verbs by which other classes of words are made almost unnecessary, and one word is able to express a whole sentence, or even a compound sentence, including subordinate clauses. This process is founded on radical words to which additional or imperfect words, or affixes, are attached; and on the inflexion, which for transitive verbs indicates subject as well as object, likewise by means of additions. The number of affixes that can be attached to a radical word in order to form one derivative is not fixed, but it rarely amounts to ten. Although their application and arrangement also is restricted by several rules,

¹ "*Tales and Traditions of the Eskimo.*" Edited by Dr. Robert Brown. (Edinburgh, 1875.)

the combinations which can be formed by them for the same radical nevertheless amount to amazing numbers. On trying to calculate the derivatives which in this way they can produce, we are gradually threatened by the prospect of arriving at hundreds of thousands. But on the other hand, we must remember at the same time that one transitive verb amongst these derivatives may be rich enough in ideas to require twenty words of one of our European languages in order to be translated.

The uniformity of the language implies that the tribes, now so widely spread, once inhabited a narrower original home. The spreading by migrations from this home must have been effected very slowly and gradually on account of the scarcity of provisions which they would carry along with them, the necessity of procuring every day their subsistence by hunting, and, finally, their ignorance respecting the regions into which they penetrated, and which were first discovered by them. However, it seems probable that a thousand years ago they had already reached about the present limits of the territory now occupied by them. Assuming that the dialectic differences between the present tribes are chiefly proportionate to the time during which they have been separated, I have tried to indicate this, or in other words, the mutual relationship of the tribes, by means of the following genealogical table:—



We are compelled to believe that the Aleutians were already separated from the principal tribe at some period anterior to the arrival of the latter at the coast. The remains which are found in the lower strata of the rubbish heaps on the inhabited places of the Aleutian Islands differ from the corresponding remains which are known to occur in other Eskimo settlements. Perhaps the original Aleutians had visited and reconnoitred the islands annually from the American continent at a certain

season before they finally settled upon them. Hence the Western Eskimo on settling on the sea-coast found these islands already inhabited. After this, the other chief divisions separated and occupied their territories as the table shows. It must be supposed that at a relatively modern date, though perhaps more than a thousand years ago, the Greelanders and Labradorians issued from the middle regions, and it still remains difficult to understand how the comparatively numerous emigrants to Greenland could find this country *via* Smith's Sound, as there seems to be no possibility of their having had any idea of its extension, at least to the south.

The division here adopted is founded chiefly on the manner in which the dialects are represented by dictionaries and vocabularies. I believe, however, that as regards the principal groups, I to V in the table, their determination agrees with the relationship and intercourse between the tribes as well as the geographical situation of their domains. But as regards the subdivisions, of course the table is very imperfect on account of our defective sources of information. The Western tribes may be tolerably well represented by the names here stated, and especially, I believe, the distinction between the northern and the southern tribes to be well founded, the latter exhibiting signs of having been influenced by the Aleutians. But as to the middle group (III), which comprises the inhabitants of the regions between the Mackenzie River district, Labrador and Greenland, a more thorough investigation would very probably show more dialects worthy of being mentioned than those indicated by the three localities specified in the table. Of course, Greenland and Labrador also ought to have subdivisions.

In instituting a comparison between the dialects, the first object is to determine and arrange the radical words in each of them. The system of arranging the words by grouping the derivatives with their radicals is perfectly carried out in the Greenland dictionary. It can be tolerably well found in that of Labrador also. But as regards the lists of words in the other dialects, no attention whatever has been paid to it, and for this reason, as well as on account of the orthographical confusion in the words heard and written down by French, English, Russian, and German travellers, it was a difficult task to determine which words are to be considered radicals. However, I ventured to try it. I find their number in Greenland to be 1,371, in Labrador, 1,207, of which 148 are uncertain. The vocabularies of the middle regions gave 601, of the Mackenzies 1,077, of the Western 903 radical words, of which, however, respectively, 102, 303, and 434 were uncertain. In order to compare these radicals of the different dialects with each other, the best way

will be to use the Greenland tongue as the standard. Of course it would be very difficult to decide whether a certain Greenlandish word is really unknown in some of the other dialects. But it will not be impossible to obtain a satisfactory result by trying the opposite problem, namely, by examining the lists of words in the other dialects and calculating how many of them relatively are unknown in Greenland. I have hitherto found 5 per cent. in the Western and 3 per cent. in the other dialects, but on account of those just named as "uncertain," probably at least twenty have to be added to the first, and eight to the latter number.

In calculating the following numbers I inferred as to several words wanting in the vocabularies of the middle regions, but occurring on both sides, in the Mackenzie as well as the Labrador idioms, that their absence was solely due to the brevity of the said vocabularies. This inference admitted, the radical words which I could find occurring in all the dialects amounted to 370, in all excepting the Western, 280; only in Greenland and Labrador, 277. Notwithstanding the misinterpreted and corrupted state in which many words occur in the published glossaries, the result of a comparison leaves no doubt that there exists a distinct difference between the Western tribes, on one side, and the Eastern, including the Mackenzie River ones, on the other. Moreover, considering that the only communication possible between the Labradorians and the Greenlanders was *via* Smith's Sound, the similarity of their language is surprising, and is in keeping with the striking resemblance of their folklore. But while in this way we recognize minute details from one of the opposite coasts of Davis Strait, on the other we have an opportunity of seeing how certain words, known in the middle regions as well as on the Mackenzie, on their wandering to either Labrador or Greenland, have modified their sense, or are lost, some of them wholly, some of them as radical words, but preserved in derivatives.

If our sources of information are imperfect with regard to the radical words, they are found still more so in passing to the additional or affixes, and finally in trying to find out the flexional endings or grammatical forms. We cannot expect to find very compound words in the glossaries composed by means of answers elicited by travellers from the natives. Here and there, however, affixes make their appearance. Conformably to an earlier calculation the number of affixes in Greenlandish was 140; some recent and very careful investigations have raised their number to nearly 200. In running over the Western vocabularies I easily picked out about 30; the Mackenzie dictionary certainly includes two or three times this number,

and as to the Labradorians we certainly may suppose that the affixes correspond to those of Greenland.

As to Greenlandish (partially including Labradorian), we possess a grammar of extraordinary value; in the Mackenzie dialect there is only an elementary grammatical essay; in the Western merely a fragment of the same, but the Aleutian language appears to be represented by a more complete grammar. The latter is especially interesting to us by proving that the Aleutian has a structure quite analogous to that of the Greenlandish, though these languages are widely different as regards their radical words. This confirms what from other reasons may be inferred, namely, that the peculiar, and in many respects admirable, organisation of the Greenlandish language cannot have been developed since the separation of the tribes, but must be regarded as their common property handed down from the earliest ages. Certainly, also, grammatical differences are observed, and I believe such as could offer peculiar interest to linguists. But the observations hitherto made are too fragmentary to be mentioned here.

The usual and more direct method of comparing languages by translating lists of words of our own language into those to be compared, if applied here, would comprise the derivatives as well as their radicals. I have tried such a comparison, restricted to a few classes of notions or ideas.

As the words of the other dialects which signify parts of the human or animal body appeared to exhibit comparatively few, but those related to human industry or workmanship more frequent differences from the same in Greenlandish, I tried to calculate the proportions in certain numbers of them. I found that of the first class of words the Western dialects had one-third, the other dialects together one-sixth, differing from Greenlandish, and of the second the Western two-thirds, and the others one-fourth differing from the Greenlandish. But it must be remarked that frequently the Greenlandish designation of the same object is known by the natives, in addition to that which is peculiar to their district, and which I have counted among the differences. This may be misleading in drawing conclusions as to the absolute difference. But the calculation still proves that a contrast exists between the eastern dialects and those beyond the Mackenzie.

The names of animals do not differ very much excepting by being confounded and applied on different species. This especially refers to certain kinds of seals. The radical word for salmon, *eqaluk*,¹ is met with under various forms, and partly

¹ I have here preferred to use the letter *q* for the peculiar Greenlandish guttural *k*.

signifying fish in general; its frequent occurrence in the glossaries reminds us of the importance the salmon may have had for the original Eskimo.

Animals only known by tradition generally grow fabulous, and are endowed with supernatural powers. Such are, in Greenland, the wolf, *amaroq*, a rat-like animal called *avingaq*, and the *kilivfaq*, which on the Mackenzie signifies the fossil elephant or mammoth. The names, *sava*, sheep; and *nisa*, dolphin, have hitherto been regarded as remnants of the language of the ancient Norse settlers in Greenland, but I have met with them in Labradorian as well as in Mackenzie. The Greenlandish *kuáneq*, the Angelica plant, is likewise considered of Scandinavian origin, but we find it in Labrador, used for a kind of sea-weed.

The general word for man (mankind), *inuk*, pl. *inuit*, is known from Greenland to Bering-Strait, but here at the same time other designations are met with; *suk*, pl. *sútt*, and *tan*, pl. *tagut*, the latter apparently akin to the Aleutian. Among the fabulous "inlanders" of the Greenlanders, the *ergileq*, pl. *ergigdlit*, goes as far as Mackenzie where it is used for the Loucheux-Indians. But in the Western dialects the Indians receive other names. It is curious that the natives of Greenland, Labrador, and Mackenzie have agreed in adopting *qavdlunâq* for white men, although they first became acquainted with these foreigners centuries after their separation. The Westerns do not seem to know this appellation, whereas they call the Russians *koschagak*, which evidently reminds one of "Cossacks."

As regards the celestial bodies, we meet with a greater difference than might be expected. In Greenlandish the moon is called *gaumat*; in the other dialects into Bering-Strait, *takik*; while here again at the same time other names are generally used. The Greenlandish *seqineq*, sun, and *uvdloriaq*, star, are likewise kept on to Bering-Strait, where several other designations are found predominating. However, with regard to the celestial bodies in general, perhaps a sharp distinction ought to be made between the mythical and the natural names of the same objects.

To indicate the quarters of the globe the Greenlanders use at once two systems. Besides the ordinary one they derive another from the view of the open sea, distinguishing what is to the left and to the right hand.

The latter appears to have been the original method of determining the bearings, but gradually the words for the left and the right side came to signify at the same time "south" and "north." The same duplicity may have prevailed

in the other Eskimo countries, and caused some of the confusion now met with in the travellers' accounts. As for the rest, the radical words used for this class of notions are almost the same near Bering-Strait as in Greenland.

The examples here adduced may suffice. They are abstracted from a collection of words which, large as it already is, I still hope to be enabled to augment and correct. I have finally only to mention a discovery of which I received intelligence quite lately. A Norwegian traveller, Herr Jakobsen, who has recently visited Alaska for the purpose of acquiring ethnological collections for the Royal Museum at Berlin, mentions the existence of extensive ruins on the banks of the River Yukon, not far from its outlet. He states that traditions exist of a comparatively large Eskimo population having lived here, adding that Alaska on the whole must have had several times more inhabitants formerly than now. He suggests that the situation of the ruins must be in some way related to the frontier between the Eskimo and Indians, who, however, are not so strictly divided here as eastward on the American continent. In my "Tales and Traditions of the Eskimo," I have explained my reasons for supposing that the original Eskimo were inlanders, who, yielding to the pressure of other tribes, were finally driven to the Arctic Ocean following the river courses. Here they discovered the resources which seal-hunting offered. But the development of the art of navigating the Arctic Ocean by *kayak* and *umiak* was connected with a change of state of culture that must have required time, perhaps centuries, and during this period of transition the rivers offered the only means for subsistence. This would be connected with a temporary accumulation of inhabitants towards the river-mouths. The ruins referred to might offer additional evidence to show that the rivers of North-West America were the routes by which the Arctic shores received their inhabitants. But of course North-Eastern Asia also exhibits rivers containing ample supplies for subsistence. I believe that a continued investigation of ruins or refuse-heaps, in connection with traditional tales and dialects, will throw more light on these questions which are so full of interest in regard to the earliest history of mankind.

ANTHROPOLOGICAL MISCELLANEA.

REGRESSION *towards* MEDIOCRITY *in* HEREDITARY STATURE.

By FRANCIS GALTON, F.R.S., &c.

[WITH PLATES IX AND X.]

THIS memoir contains the data upon which the remarks on the Law of Regression were founded, that I made in my Presidential Address to Section H, at Aberdeen. That address, which will appear in due course in the Journal of the British Association, has already been published in "Nature," September 24th. I reproduce here the portion of it which bears upon regression, together with some amplification where brevity had rendered it obscure, and I have added copies of the diagrams suspended at the meeting, without which the letterpress is necessarily difficult to follow. My object is to place beyond doubt the existence of a simple and far-reaching law that governs the hereditary transmission of, I believe, every one of those simple qualities which all possess, though in unequal degrees. I once before ventured to draw attention to this law on far more slender evidence than I now possess.

It is some years since I made an extensive series of experiments on the produce of seeds of different size but of the same species. They yielded results that seemed very noteworthy, and I used them as the basis of a lecture before the Royal Institution on February 9th, 1877. It appeared from these experiments that the offspring did *not* tend to resemble their parent seeds in size, but to be always more mediocre than they—to be smaller than the parents, if the parents were large; to be larger than the parents, if the parents were very small. The point of convergence was considerably below the average size of the seeds contained in the large bagful I bought at a nursery garden, out of which I selected those that were sown, and I had some reason to believe that the size of the seed towards which the produce converged was similar to that of an average seed taken out of beds of self-planted specimens.

The experiments showed further that the mean filial regression towards mediocrity was directly proportional to the parental deviation from it. This curious result was based on so many plantings, conducted for me by friends living in various parts of the country, from Nairn in the north to Cornwall in the south, during one, two, or even three generations of the plants, that I could entertain no doubt of the truth of my conclusions. The exact ratio of regression remained a little doubtful, owing to variable influences; therefore I did not attempt to define it. But as it seems a pity that no

record should exist in print of the general averages, I give them, together with a brief account of the details of the experiment, in Appendix I to the present memoir.

After the lecture had been published, it occurred to me that the grounds of my misgivings might be urged as objections to the general conclusions. I did not think them of moment, but as the inquiry had been surrounded with many small difficulties and matters of detail, it would be scarcely possible to give a brief and yet a full and adequate answer to such objections. Also, I was then blind to what I now perceive to be the simple explanation of the phenomenon, so I thought it better to say no more upon the subject until I should obtain independent evidence. It was anthropological evidence that I desired, caring only for the seeds as means of throwing light on heredity in man. I tried in vain for a long and weary time to obtain it in sufficient abundance, and my failure was a cogent motive, together with others, in inducing me to make an offer of prizes for Family Records, which was largely responded to, and furnished me last year with what I wanted. I especially guarded myself against making any allusion to this particular inquiry in my prospectus, lest a bias should be given to the returns. I now can securely contemplate the possibility of the records of height having been frequently drawn up in a careless fashion, because no amount of unbiassed inaccuracy can account for the results, contrasted in their values but concurrent in their significance, that are derived from comparisons between different groups of the returns.

An analysis of the Records fully confirms and goes far beyond the conclusions I obtained from the seeds. It gives the numerical value of the regression towards mediocrity in the case of human stature, as from 1 to $\frac{2}{3}$ with unexpected coherence and precision [see Plate IX, fig. (a)], and it supplies me with the class of facts I wanted to investigate—the degrees of family likeness in different degrees of kinship, and the steps through which special family peculiarities become merged into the typical characteristics of the race at large.

My data consisted of the heights of 930 adult children and of their respective parentages, 205 in number. In every case I transmuted the female statures to their corresponding male equivalents and used them in their transmuted form, so that no objection grounded on the sexual difference of stature need be raised when I speak of averages. The factor I used was 1.08, which is equivalent to adding a little less than one-twelfth to each female height. It differs a very little from the factors employed by other anthropologists, who, moreover, differ a trifle between themselves; anyhow, it suits my data better than 1.07 or 1.09. The final result is not of a kind to be affected by these minute details, for it happened that, owing to a mistaken direction, the computer to whom I first entrusted the figures used a somewhat different factor, yet the result came out closely the same.

I shall now explain with fulness why I chose stature for the

TABLE I.
NUMBER OF ADULT CHILDREN OF VARIOUS STATURES BORN OF 205 MID-PARENTS OF VARIOUS STATURES.
(All Female heights have been multiplied by 1.08).

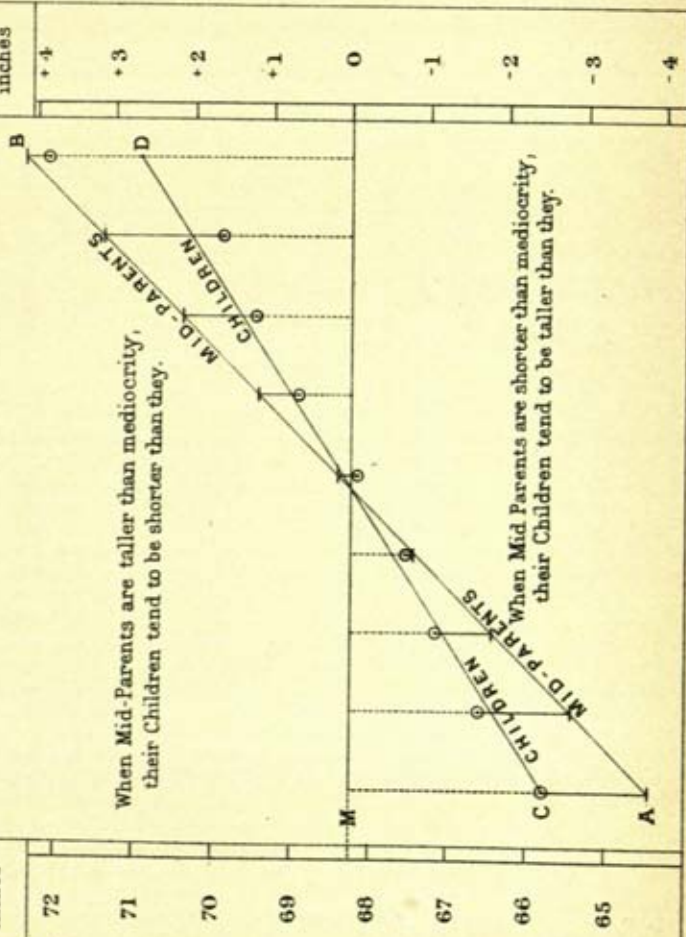
Heights of the Mid- the Mid- parents in inches.	Heights of the Adult Children.													Total Number of		Medians.	
														Adult Children.	Mid- parents.		
	Below	62.2	63.2	64.2	65.2	66.2	67.2	68.2	69.2	70.2	71.2	72.2	73.2	Above			
Above ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	5	..
72.5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	6	72.2
71.5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	43	11	69.9
70.5	1	..	..	..	..	..	..	..	..	..	..	..	..	..	68	22	69.5
69.5	..	..	1	..	1	3	12	18	14	7	4	3	3	5	183	41	68.9
68.5	1	..	1	16	4	17	27	20	33	25	20	11	4	4	219	49	68.2
67.5	..	..	7	11	16	25	31	34	48	21	18	4	3	..	211	33	67.6
66.5	..	3	5	14	15	36	38	28	38	19	11	4	..	..	78	20	67.2
65.5	1	3	5	2	17	17	14	13	4	..	2	1	..	..	66	12	66.7
64.5	1	1	4	4	1	5	..	..	..	..	..	..	..	..	23	5	65.8
Below ..	1	..	2	4	1	2	1	1	..	..	..	..	..	..	14	1	..
Totals ..	5	7	32	59	48	117	138	120	167	99	64	41	17	14	928	205	..
Medians ..	..	..	66.3	67.8	67.9	67.7	67.9	68.3	68.5	69.0	69.0	70.0	..	..	..	..	..

NOTE.—In calculating the Medians, the entries have been taken as referring to the middle of the squares in which they stand. The reason why the headings run 62.2, 63.2, &c., instead of 62.5, 63.5, &c., is that the observations are unequally distributed between 62 and 63, 63 and 64, &c., there being a strong bias in favour of integral inches. After careful consideration, I concluded that the headings, as adopted, best satisfied the conditions. This inequality was not apparent in the case of the Mid-parents.

Plate IX.

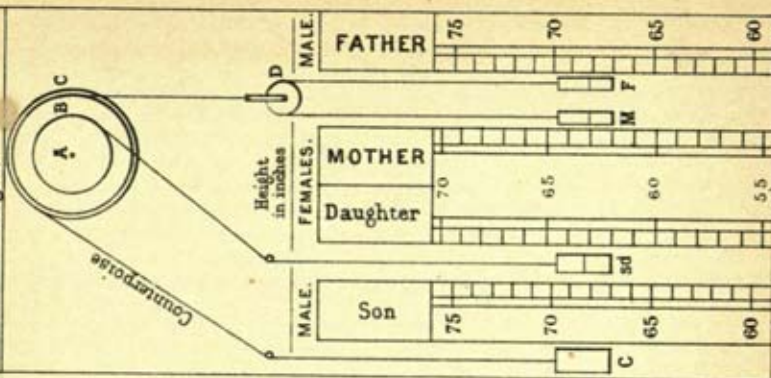
RATE OF REGRESSION IN HEREDITARY STATURE.

Fig. (a).

HEIGHT
in
inchesThe Deviates of the Children are to those of
their Mid-Parents as 2 to 3.DEVIATE
in
inches

FORECASTER OF STATURE

Fig. (b).



RECEIVED

RECEIVED

RECEIVED

RECEIVED

RECEIVED

ADULT CHILDREN
their Heights, and Deviations from 68½ inches.

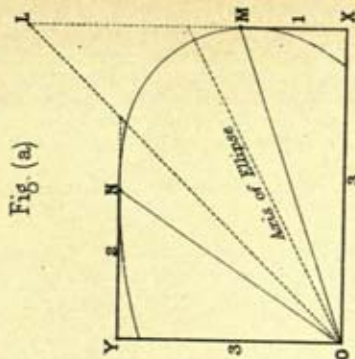


Fig. (a)

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subject of inquiry, because the peculiarities and points to be attended to in the investigation will manifest themselves best by doing so. Many of its advantages are obvious enough, such as the ease and frequency with which its measurement is made, its practical constancy during thirty-five years of middle life, its small dependence on differences of bringing up, and its inconsiderable influence on the rate of mortality. Other advantages which are not equally obvious are no less great. One of these lies in the fact that stature is not a simple element, but a sum of the accumulated lengths or thicknesses of more than a hundred bodily parts, each so distinct from the rest as to have earned a name by which it can be specified. The list of them includes about fifty separate bones, situated in the skull, the spine, the pelvis, the two legs, and the two ankles and feet. The bones in both the lower limbs are counted, because it is the average length of these two limbs that contributes to the general stature. The cartilages interposed between the bones, two at each joint, are rather more numerous than the bones themselves. The fleshy parts of the scalp of the head and of the soles of the feet conclude the list. Account should also be taken of the shape and set of many of the bones which conduce to a more or less arched instep, straight back, or high head. I noticed in the skeleton of O'Brien, the Irish giant, at the College of Surgeons, which is, I believe, the tallest skeleton in any museum, that his extraordinary stature of about 7 feet 7 inches would have been a trifle increased if the faces of his dorsal vertebræ had been more parallel and his back consequently straighter.

The beautiful regularity in the statures of a population, whenever they are statistically marshalled in the order of their heights, is due to the number of variable elements of which the stature is the sum. The best illustrations I have seen of this regularity were the curves of male and female statures that I obtained from the careful measurements made at my Anthropometric Laboratory in the International Health Exhibition last year. They were almost perfect.

The multiplicity of elements, some derived from one progenitor, some from another, must be the cause of a fact that has proved very convenient in the course of my inquiry. It is that the stature of the children depends closely on the average stature of the two parents, and may be considered in practice as having nothing to do with their individual heights. The fact was proved as follows:—After transmuting the female measurements in the way already explained, I sorted the adult children of those parents who severally differed 1, 2, 3, 4, and 5 or more inches, into separate lines (see Table II). Each line was then divided into similar classes, showing the number of cases in which the children differed 1, 2, 3, &c., inches from the common average of the children in their respective families. I confined my inquiry to large families of six children and upwards, that the common average of each might be a trustworthy point of reference. The entries in each of the different lines were then seen to run in the

same way, except that in the last of them the children showed a faint tendency to fall into two sets, one taking after the tall parent, the other after the short one; this, however, is not visible in the summary Table II that I annex. Therefore, when dealing with the transmission of stature from parents to children, the average height of the two parents, or, as I prefer to call it, the "mid-parental" height, is all we need care to know about them.

TABLE II.

EFFECT UPON ADULT CHILDREN OF DIFFERENCES IN HEIGHT OF THEIR PARENTS.

Difference between the Heights ¹ of the Parents in inches.	Proportion per 50 of cases in which the Heights ¹ of the Children deviated to various amounts from the Mid-filial Stature of their respective families.						Number of Children whose Heights were observed.
	Less than 1 inch.	Less than 2 inches.	Less than 3 inches.	Less than 4 inches.	Less than 5 inches.	Within Extreme Limit.	
Under 1 ..	21	35	43	46	48	50	105
1 and under 2..	23	37	46	49	50	..	122
2 " 3..	16	34	41	45	49	50	112
3 " 5..	24	35	41	47	49	50	108
5 and above ..	18	30	40	47	49	50	78

¹ Every female height has been transmuted to its male equivalent by multiplying it by 1.08, and only those families have been included in which the number of adult children amounted to six, at least.

NOTE.—When these figures are protracted into curves, it will be seen—(1) that they run much alike; (2) that their peculiarities are not in sequence; and (3) that the curve corresponding to the first line occupies a medium position. It is therefore certain that differences in the heights of the parents have on the whole an inconsiderable effect on the heights of their offspring.

It must be noted that I use the word parent without specifying the sex. The methods of statistics permit us to employ this abstract term, because the cases of a tall father being married to a short mother are balanced by those of a short father being married to a tall mother. I use the word parent to save any complication due to a fact apparently brought out by these inquiries, that the height of the children of both sexes, but especially that of the daughters, takes after the height of the father more than it does after that of the mother. My present data are insufficient to enable me to speak with any confidence on this point, much less to determine the ratio satisfactorily.

Another great merit of stature as a subject for inquiries into heredity is that marriage selection takes little or no account of

shortness or tallness. There are undoubtedly sexual preferences for moderate contrast in height, but the marriage choice is guided by so many and more important considerations that questions of stature appears to exert no perceptible influence upon it. This is by no means my only inquiry into this subject, but, as regards the present data, my test lay in dividing the 205 male parents and the 205 female parents each into three groups—T, M, and S—that is, tall, medium, and short (medium male measurement being taken as 67 inches and upwards to 70 inches), and in counting the number of marriages in each possible combination between them (see Table III). The result was that men and women of contrasted heights, short and tall or tall and short, married just about as frequently as men and women of similar heights, both tall or both short; there were 32 cases of the one to 27 of the other.

TABLE III.

S., t. 12 cases.	M., t. 20 cases.	T., t. 18 cases.
S., m. 25 cases.	M., m. 51 cases.	T., m. 28 cases.
S., s. 9 cases.	M., s. 28 cases.	T., s. 14 cases.

Short and tall, 12 + 14 = 32 cases.

Short and short, 9 }
Tall and tall, 18 } = 27 cases.

In applying the law of probabilities to investigations into heredity of stature, we may therefore regard the married folk as couples picked out of the general population at haphazard.

The advantages of stature as a subject in which the simple laws of heredity may be studied will now be understood. It is a nearly constant value that is frequently measured and recorded, and its discussion is little entangled with considerations of nurture, of the survival of the fittest, or of marriage selection. We have only to consider the mid-parentage and not to trouble ourselves about the parents separately. The statistical variations of stature are extremely regular, so much so that their general conformity with the results of calculations based on the abstract law of frequency of error is an accepted fact by anthropologists. I have made much use of the properties of that law in cross-testing my various conclusions, and always with success. For example, the measure of variability (say the "probable error") of the system of mid-parental heights, ought, on the suppositions justified in the preceding paragraphs, to be equal to that of the system of adult male heights, multiplied into the square root of 2; this inference is shown to be correct by direct observation.

The only drawback to the use of stature is its small variability. One-half of the population with whom I dealt, varied less than 1.7 inch from the average of all of them, and one-half of the offspring of similar mid-parentages varied less than 1.5 inch from the average of their own heights. On the other hand, the precision of my data is so small, partly due to the uncertainty in many cases whether the height was measured with the shoes on or off, that I find by means of an independent inquiry that each observation, taking one with another, is liable to an error that as often as not exceeds $\frac{2}{3}$ of an inch.

The law that I wish to establish refers primarily to the inheritance of different degrees of tallness and shortness, and only secondarily to that of absolute stature. That is to say, it refers to measurements made from the crown of the head to the level of mediocrity, upwards or downwards as the case may be, and not from the crown of the head to the ground. In the population with which I deal the level of mediocrity is $68\frac{1}{4}$ inches (without shoes). The same law applying with sufficient closeness both to tallness and shortness, we may include both under the single head of deviations, and I shall call any particular deviation a "deviate." By the use of this word and that of "mid-parentage" we can define the law of regression very briefly. It is that the height-deviate of the offspring is, on the average, two-thirds of the height-deviate of its mid-parentage.

Plate IX, fig. *a*, gives a graphic expression of the data upon which this law is founded. It will there be seen that the relations between the statures of the children and their mid-parents, which are perfectly simple when referred to the scale of deviates at the right hand of the plate, do not admit of being briefly phrased when they are referred to the scale of statures at its left.

If this remarkable law had been based only on experiments on the diameters of the seeds, it might well be distrusted until confirmed by other inquiries. If it were corroborated merely by a comparatively small number of observations on human stature, some hesitation might be expected before its truth could be recognised in opposition to the current belief that the child tends to resemble its parents. But more can be urged than this. It is easily to be shown that we ought to expect filial regression, and that it should amount to some constant fractional part of the value of the mid-parental deviation. It is because this explanation confirms the previous observations made both on seeds and on men that I feel justified on the present occasion in drawing attention to this elementary law.

The explanation of it is as follows. The child inherits partly from his parents, partly from his ancestry. Speaking generally, the further his genealogy goes back, the more numerous and varied will his ancestry become, until they cease to differ from any equally numerous sample taken at haphazard from the race at large. Their mean stature will then be the same as that of the race; in other words, it will be mediocre. Or, to put the same fact into

another form, the most probable value of the mid-ancestral deviates in any remote generation is zero.

For the moment, let us confine our attention to the remote ancestry and to the mid-parentages, and ignore the intermediate generations. The combination of the zero of the ancestry with the deviate of the mid-parentage is the combination of nothing with something, and the result resembles that of pouring a uniform proportion of pure water into a vessel of wine. It dilutes the wine to a constant fraction of its original alcoholic strength, whatever that strength may have been.

The intermediate generations will each in their degree do the same. The mid-deviate in any one of them will have a value intermediate between that of the mid-parentage and the zero value of the ancestry. Its combination with the mid-parental deviate will be as if, not pure water, but a mixture of wine and water in some definite proportion, had been poured into the wine. The process throughout is one of proportionate dilutions, and therefore the joint effect of all of them is to weaken the original wine in a constant ratio.

We have no word to express the form of that ideal and composite progenitor, whom the offspring of similar mid-parentages most nearly resemble, and from whose stature their own respective heights diverge evenly, above and below. If he, she, or it, is styled the "generant" of the group, then the law of regression makes it clear that parents are not identical with the generants of their own offspring.

The average regression of the offspring to a constant fraction of their respective mid-parental deviations, which was first observed in the diameters of seeds, and then confirmed by observations on human stature, is now shown to be a perfectly reasonable law which might have been deductively foreseen. It is of so simple a character that I have made an arrangement with pulleys and weights by which the probable average height of the children of known parents can be mechanically reckoned (see Plate IX, fig. *b*). This law tells heavily against the full hereditary transmission of any gift, as only a few of many children would resemble their mid-parentage. The more exceptional the amount of the gift, the more exceptional will be the good fortune of a parent who has a son who equals, and still more if he has a son who overpasses him in that respect. The law is even-handed; it levies the same heavy succession-tax on the transmission of badness as well as of goodness. If it discourages the extravagant expectations of gifted parents that their children will inherit all their powers, it no less discountenances extravagant fears that they will inherit all their weaknesses and diseases.

The converse of this law is very far from being its numerical opposite. Because the most probable deviate of the son is only two-thirds that of his mid-parentage, it does not in the least follow that the most probable deviate of the mid-parentage is $\frac{2}{3}$, or $1\frac{1}{2}$ that of the son. The number of individuals in a population who

differ little from mediocrity is so preponderant that it is more frequently the case that an exceptional man is the somewhat exceptional son of rather mediocre parents, than the average son of very exceptional parents. It appears from the very same table of observations by which the value of the filial regression was determined when it is read in a different way, namely, in vertical columns instead of in horizontal lines, that the most probable mid-parentage of a man is one that deviates only one-third as much as the man does. There is a great difference between this value of $\frac{1}{3}$ and the numerical converse mentioned above of $\frac{3}{2}$; it is four and a half times smaller, since $4\frac{1}{2}$, or $\frac{9}{2}$, being multiplied into $\frac{1}{3}$, is equal to $\frac{3}{2}$.

It will be gathered from what has been said, that a mid-parental deviate of one unit implies a mid-grandparental deviate of $\frac{1}{3}$, a mid-ancestral unit in the next generation of $\frac{1}{9}$, and so on. I reckon from these and other data, by methods that I cannot stop now to explain, but will do so in the Appendix, that the heritage derived on an average from the mid-parental deviate, independently of what it may imply, or of what may be known concerning the previous ancestry, is only $\frac{1}{3}$. Consequently, that similarly derived from a single parent is only $\frac{1}{4}$, and that from a single grandparent is only $\frac{1}{16}$.

Let it not be supposed for a moment that any of these statements invalidate the general doctrine that the children of a gifted pair are much more likely to be gifted than the children of a mediocre pair. What they assert is that the ablest child of one gifted pair is not likely to be as gifted as the ablest of all the children of very many mediocre pairs. However, as, notwithstanding this explanation, some suspicion may remain of a paradox lurking in my strongly contrasted results, I will call attention to the form in which the table of data (Table I) was drawn up, and give an anecdote connected with it.

It is deduced from a large sheet on which I entered every child's height, opposite to its mid-parental height, and in every case each was entered to the nearest tenth of an inch. Then I counted the number of entries in each square inch, and copied them out as they appear in the table. The meaning of the table is best understood by examples. Thus, out of a total of 928 children who were born to the 205 mid-parents on my list, there were 18 of the height of 69.2 inches (counting to the nearest inch), who were born to mid-parents of the height of 70.5 inches (also counting to the nearest inch). So again there were 25 children of 70.2 inches born to mid-parents of 69.5 inches. I found it hard at first to catch the full significance of the entries in the table, which had curious relations that were very interesting to investigate. They came out distinctly when I "smoothed" the entries by writing at each intersection of a horizontal column with a vertical one, the sum of the entries in the four adjacent squares, and using these to work upon. I then noticed (see Plate X) that lines drawn through entries of the same value formed a series of concentric and similar

ellipses. Their common centre lay at the intersection of the vertical and horizontal lines, that corresponded to $68\frac{1}{2}$ inches. Their axes were similarly inclined. The points where each ellipse in succession was touched by a horizontal tangent, lay in a straight line inclined to the vertical in the ratio of $\frac{2}{3}$; those where they were touched by a vertical tangent lay in a straight line inclined to the horizontal in the ratio of $\frac{1}{3}$. These ratios confirm the values of average regression already obtained by a different method, of $\frac{2}{3}$ from mid-parent to offspring, and of $\frac{1}{3}$ from offspring to mid-parent, because it will be obvious on studying Plate X that the point where each horizontal line in succession is touched by an ellipse, the greatest value in that line must occur at the point of contact. The same is true in respect to the vertical lines. These and other relations were evidently a subject for mathematical analysis and verification. They were all clearly dependent on three elementary data, supposing the law of frequency of error to be applicable throughout; these data being (1) the measure of racial variability, whence that of the mid-parentages may be inferred as has already been explained, (2) that of co-family variability (counting the offspring of like mid-parentages as members of the same co-family), and (3) the average ratio of regression. I noted these values, and phrased the problem in abstract terms such as a competent mathematician could deal with, disentangled from all reference to heredity, and in that shape submitted it to Mr. J. Hamilton Dickson, of St. Peter's College, Cambridge. I asked him kindly to investigate for me the surface of frequency of error that would result from these three data, and the various particulars of its sections, one of which would form the ellipses to which I have alluded.

I may be permitted to say that I never felt such a glow of loyalty and respect towards the sovereignty and magnificent sway of mathematical analysis as when his answer reached me, confirming, by purely mathematical reasoning, my various and laborious statistical conclusions with far more minuteness than I had dared to hope, for the original data ran somewhat roughly, and I had to smooth them with tender caution. His calculation corrected my observed value of mid-parental regression from $\frac{1}{3}$ to $\frac{6}{17.6}$, the relation between the major and minor axis of the ellipses was changed 3 per cent. (it should be as $\sqrt{7} : \sqrt{2}$), their inclination was changed less than 2° (it should be to an angle whose tangent is $\frac{1}{3}$). It is obvious, then, that the law of error holds throughout the investigation with sufficient precision to be of real service, and that the various results of my statistics are not casual and disconnected determinations, but strictly interdependent.

In the lecture at the Royal Institution to which I have referred, I pointed out the remarkable way in which one generation was succeeded by another that proved to be its statistical counterpart. I there had to discuss the various agencies of the survival of the fittest, of relative fertility, and so forth; but the selection of

human stature as the subject of investigation now enables me to get rid of all these complications and to discuss this very curious question under its simplest form. How is it, I ask, that in each successive generation there proves to be the same number of men per thousand, who range between any limits of stature we please to specify, although the tall men are rarely descended from equally tall parents, or the short men from equally short? How is the balance from other sources so nicely made up? The answer is that the process comprises two opposite sets of actions, one concentrative and the other dispersive, and of such a character that they necessarily neutralise one another, and fall into a state of stable equilibrium (see Table IV). By the first set, a system of scattered elements is replaced by another system which is less scattered; by the second set, each of these new elements becomes a centre whence a third system of elements are dispersed.

The details are as follows:—In the first of these two stages we start from the population generally, in the first generation; then the units of the population group themselves, as it were by chance, into married couples, whence the more compact system of mid-parentages is derived, and then by a regression of the values of the mid-parentages the still more compact system of the generants is derived. In the second stage each generant is a centre whence the offspring diverge upwards and downwards to form the second generation. The stability of the balance between the opposed tendencies is due to the regression being proportionate to the deviation. It acts like a spring against a weight; the spring stretches until its resilient force balances the weight, then the two forces of spring and weight are in stable equilibrium; for if the weight be lifted by the hand, it will obviously fall down again when the hand is withdrawn, and, if it be depressed by the hand, the resilience of the spring will be thereby increased, so that the weight will rise when the hand is withdrawn.

A simple equation connects the three data of race variability, of the ratio of regression, and of co-family variability, whence, if any two are given, the third may be found. My observations give separate measures of all three, and their values fit well into the equation, which is of the simple form—

$$v^2 \frac{p^2}{2} + f^2 = p^2,$$

where $v = \frac{2}{3}$, $p = 1.7$, $f = 1.5$.

It will therefore be understood that the complete table of mid-parental and filial heights may be calculated from two simple numbers, and that the most elementary data upon which it admits of being constructed are—(1) the ratio between the mid-parental and the rest of the ancestral influences, and (2) the measure of the co-family variability.

The mean regression in stature of a population is easily ascertained; I do not see much use in knowing it, but will give the work merely as a simple example. It has already been stated that half

TABLE IV.
PROCESS THROUGH WHICH THE DISTRIBUTION OF STATURES, IN SUCCESSIVE GENERATIONS OF THE SAME PEOPLE, REMAINS UNCHANGED.

Height in Inches.		Statistical Distribution of Statures in the several Systems of							Deviation in Inches.	
		GENERATION I.	MID-PARENTS.	CONCENTRATES.	CONCENTRATES.	GENERANTS.	DISPERSES.	GENERATION II.		
73	-	2		CONCENTRATES.	CONCENTRATES.		DISPERSES.	2		
72	+ 4	6	2			1		6		
71	+ 3	10	6			7		10		
70	+ 2	15	16			13		15		Upper Quartile.
69	+ 1	17	26			29		17		
68	0	17	26			29		17		MEDIAN.
67	- 1	15	16			13		15		
66	- 2	10	6		CONCENTRATES.	7	DISPERSES.	10		Lower Quartile.
65	- 3	6	2			1		6		
64	- 4	2						2		
Total	...	100	100			100		100		
Probable derivation	...	1.7	1.2			0.8		1.7		

NOTE.—The cases are symmetrically disposed above and below the common mean value of 68½ inches. The Upper and Lower Quartiles are the values that in each case divide the number of cases above the Median or mean value, and those below it, respectively into equal parts. Thus in each column there are (1) 25 cases per cent, above the Upper Quartile, (2) 25 cases between the Upper Quartile and the Median, (3) 25 cases between the Median and the Lower Quartile, (4) 25 cases below the Lower Quartile. The difference between either Quartile and the Median is technically called the "Probable" deviation.

the population vary less than 1.7 inch from mediocrity, this being what is technically known as the "probable" deviation. The mean deviation is, by a well-known theory, 1.18 times that of the probable deviation, therefore in this case it is 1.9 inch. The mean loss through regression is $\frac{1}{3}$ of that amount, or a little more than 0.6 inch. That is to say, taking one child with another, the mean amount by which they fall short of their mid-parental peculiarity of stature is rather more than six-tenths of an inch.

The stability of a Type, which I should define as "an ideal form towards which the children of those who deviate from it tend to regress," would, I presume, be measured by the strength of its tendency to regress; thus a mean regression from 1 in the mid-parents to $\frac{2}{3}$ in the offspring would indicate only half as much stability as if it had been to $\frac{1}{3}$.

The limits of deviation beyond which there is no regression, but a new condition of equilibrium is entered into, and a new type comes into existence, have still to be explored.

With respect to my numerical estimates, I wish emphatically to say that I offer them only as being serviceably approximate, though they are mutually consistent, and with the desire that they may be reinvestigated by the help of more abundant and much more accurate measurements than those I have had at command. There are many simple and interesting relations to which I am still unable to assign numerical values for lack of adequate material, such as that to which I referred some time back, of the relative influence of the father and the mother on the stature of their sons and daughters.

I do not now pursue the numerous branches that spring from the data I have given, as from a root. I do not speak of the continued domination of one type over others, nor of the persistency of unimportant characteristics, nor of the inheritance of disease, which is complicated in many cases by the requisite concurrence of two separate heritages, the one of a susceptible constitution, the other of the germs of the disease. Still less do I enter upon the subject of fraternal deviation and collateral descent, which I have also worked out.

APPENDIX.

I.—Experiments on Seeds bearing on the Law of Regression.

I sent a set of carefully selected sweet pea seeds to each of several country friends, who kindly undertook to help me. The advantage of sweet peas over other seeds is that they do not cross fertilise, that they are spherical, and that all the seeds in the same pod are of much the same size. They are also hardy and prolific. I selected them as the subject of experiment after consulting eminent botanists. Each set contained seven packets, numbered K, L, M, N, O, P, and Q. Each packet contained ten seeds of exactly the

same weight; those in K being the heaviest, L the next heaviest, and so on down to Q, which was the lightest. The precise weights are given in Table V, together with the corresponding diameter, which I ascertained by laying 100 peas of the same sort in a row. The weights run in an arithmetic series, having a common average difference of 0.172 grain. I do not of course profess to work to thousandths of a grain, though I did to less than tenths of a grain; therefore the third decimal place represents no more than an arithmetical working value, which has to be regarded in multiplications, lest an error of sensible importance should be introduced by its neglect. Curiously enough, the diameters were found to run approximately in an arithmetic series also, owing, I suppose, to the misshape and corrugations of the smaller seeds, which gave them a larger diameter than if they had been plumped out into spheres. The results are given in Table V, which show that I was justified in sorting the seeds by the convenient method of the balance and weights, and of accepting the weights as directly proportional to the mean diameters, which can hardly be measured satisfactorily except in spherical seeds.

In each experiment seven beds were prepared in parallel rows; each was $1\frac{1}{2}$ feet wide and 5 feet long. Ten holes of 1 inch deep were dibbled at equal distances apart along each bed, and one seed was put into each hole. They were then bushed over to keep off the birds. Minute instructions were given and followed to ensure uniformity, which I need not repeat here. The end of all was that the seeds as they became ripe were collected from time to time in bags that I sent, lettered from K to Q, the same letters being stuck at the ends of the beds, and when the crop was coming to an end the whole foliage of each bed was torn up, tied together, labelled, and sent to me. I measured the foliage and the pods, both of which gave results confirmatory of those of the peas, which will be found in Table VI, the first and last columns of which are those that especially interest us; the remaining columns showing clearly enough how these two were obtained. It will be seen that for each increase of one unit on the part of the parent seed, there is a mean increase of only one-third of a unit in the filial seed; and again that the mean filial seed resembles the parental when the latter is about 15.5 hundredths of an inch in diameter. Taking then 15.5 as the point towards which filial regression points, whatever may be the parental deviation (within the tabular limits) from that point, the mean filial deviation will be in the same direction, but only one-third as much.

This point of regression is so low that I possessed less evidence than I desired to prove the bettering of the produce of very small seeds. The seeds smaller than Q were such a miserable set that I could hardly deal with them. Moreover, they were very infertile. It did, however, happen that in a few of the sets some of the Q seeds turned out very well.

If I desired to lay much stress on these experiments, I could make my case considerably stronger by going minutely into the

details of the several experiments, foliage and length of pod included, but I do not care to do so.

TABLE V.
WEIGHTS AND DIAMETERS OF SEEDS (SWEET PEA).

Letter of seed.	Weight of one seed in grains.	Length of row of 100 seeds in inches.	Diameter of one seed in hundredths of inch.
K	1.750	21.0	21
L	1.578	20.2	20
M	1.406	19.2	19
N	1.234	17.9	18
O	1.062	17.0	17
P	.890	16.1	16
Q	.718	15.2	15

TABLE VI.
PARENT SEEDS AND THEIR PRODUCE.

Table showing the proportionate number of seeds (sweet peas) of different sizes, produced by parent seeds also of different sizes. The measurements are those of mean diameter, in hundredths of an inch.

Diameter of Parent Seed.	Diameters of Filial Seeds.								Total.	Mean Diameter of Filial Seeds.	
	Under 15	15-	16-	17-	18-	19-	20-	Above 21-		Observed.	Smoothed.
21	22	8	10	18	21	13	6	2	100	17.5	17.3
20	23	10	12	17	20	13	3	2	100	17.3	17.0
19	35	16	12	13	11	10	2	1	100	16.0	16.6
18	34	12	13	17	16	6	2	0	100	16.3	16.3
17	37	16	13	16	13	4	1	0	100	15.6	16.0
16	34	15	18	16	13	3	1	0	100	16.0	15.7
15	46	14	9	11	14	4	2	0	100	15.3	15.4

II.—*Separate Contribution of each Ancestor to the Heritage of the Offspring.*

When we say that the mid-parent contributes two-thirds of his peculiarity of height to the offspring, it is supposed that nothing is known about the previous ancestor. We now see that though nothing is known, something is implied, and that something must be eliminated if we desire to know what the parental bequest, pure and simple, may amount to. Let the deviate of the mid-parent be a , then the implied deviate of the mid-grandparent will be $\frac{1}{3}a$, of

the mid-ancestor in the next generation $\frac{1}{3}a$, and so on. Hence the sum of the deviates of all the mid-generations that contribute to the heritage of the offspring is $a(1 + \frac{1}{3} + \frac{1}{9} + \&c.) = a\frac{3}{2}$.

Do they contribute on equal terms, or otherwise? I am not prepared as yet with sufficient data to yield a direct reply, therefore we must try the effects of limiting suppositions. First, suppose they contribute equally; then as an accumulation of ancestral deviates whose sum amounts to $a\frac{3}{2}$, yields an effective heritage of only $a\frac{3}{2}$, it follows that each piece of property, as it were, must be reduced by a succession tax to $\frac{2}{3}$ of its original amount, because $\frac{3}{2} \times \frac{2}{3} = \frac{3}{2}$.

Another supposition is that of successive diminution, the property being taxed afresh in each transmission, so that the effective heritage would be—

$$a\left(\frac{1}{r} + \frac{1}{3r^2} + \frac{1}{3^2r^3} + \dots\right) = a\left(\frac{3}{3r-1}\right)$$

and this must, as before, be equal to $a\frac{3}{2}$, whence $\frac{1}{r} = \frac{6}{11}$.

The third limiting supposition of a mid-ancestral deviate in any one remote generation contributing more than a mid-parental deviate, is notoriously incorrect. Thus the descendants of "pedigree-wheat" in the (say) twentieth generation show no sign of their mid-ancestral magnitude, but those in the first generation do so most unmistakably.

The results of our two valid limiting suppositions are therefore (1) that the mid-parental deviate, pure and simple, influences the offspring to $\frac{1}{3}$ of its amount; (2) that it influences it to the $\frac{6}{11}$ of its amount. These values differ but slightly from $\frac{1}{2}$, and their mean is closely $\frac{1}{2}$, so we may fairly accept that result. Hence the influence, pure and simple, of the mid-parent may be taken as $\frac{1}{2}$, of the mid-grandparent $\frac{1}{4}$, of the mid-great-grandparent $\frac{1}{8}$, and so on. That of the individual parent would therefore be $\frac{1}{4}$, of the individual grandparent $\frac{1}{8}$, of an individual in the next generation $\frac{1}{16}$, and so on.

Explanation of Plates IX and X.

Plate IX, fig. a. Rate of Regression in Hereditary Stature.

The short horizontal lines refer to the stature of the mid-parents as given on the scale to the left. These are the same values as those in the left hand column of Table I.

The small circles, one below each of the above, show the mean stature of the children of each of those mid-parents. These are the values in the right hand column of Table I, headed "Medians." [The Median is the value that half the cases exceed, and the other fall short of it. It is practically the same as the mean, but is a more convenient value to find, in the way of working adopted throughout in the present instance.]

The sloping line *AB* passes through all possible mid-parental heights.

The sloping line *CD* passes through all the corresponding mean heights of their children. It gives the "smoothed" results of the actual observations.

The ratio of *CM* to *AM* is as 2 to 3, and this same ratio connects the deviate of every mid-parental value with the mean deviate of its offspring.

The point of convergence is at the level of mediocrity, which is 68½ inches.

The above data are derived from the 928 adult children of 205 mid-parents, female statures having in every case been converted to their male equivalents by multiplying each of them by 1.08.

Fig. *b*. Forecasts of stature. This is a diagram of the mechanism by which the most probable heights of the sons and daughters can be foretold, from the data of the heights of each of their parents.

The weights *M* and *F* have to be set opposite to the heights of the mother and father on their respective scales; then the weight *sd* will show the most probable heights of a son and daughter on the corresponding scales. In every one of these cases it is the fiducial mark in the middle of each weight by which the reading is to be made. But, in addition to this, the length of the weight *sd* is so arranged that it is an equal chance (an even bet) that the height of each son or each daughter will lie within the range defined by the upper and lower edge of the weight, on their respective scales. The length of *sd* is 3 inches = 2*f*; that is, 2×1.50 inch.

A, *B*, and *C* are three thin wheels with grooves round their edges. They are screwed together so as to form a single piece that turns easily on its axis. The weights *M* and *F* are attached to either end of a thread that passes over the movable pulley *D*. The pulley itself hangs from a thread which is wrapped two or three times round the groove of *B* and is then secured to the wheel. The weight *sd* hangs from a thread that is wrapped in the same direction two or three times round the groove of *A*, and is then secured to the wheel. The diameter of *A* is to that of *B* as 2 to 3. Lastly, a thread wrapped in the opposite direction round the wheel *C*, which may have any convenient diameter, is attached to a counterpoise.

It is obvious that raising *M* will cause *F* to fall, and *vice versa*, without affecting the wheels *AB*, and therefore without affecting *sd*; that is to say, the parental differences may be varied indefinitely without affecting the stature of the children, so long as the mid-parental height is unchanged. But if the mid-parental height is changed, then that of *sd* will be changed to $\frac{2}{3}$ of the amount.

The scale of female heights differs from that of the males, each female height being laid down in the position which would be occupied by its male equivalent. Thus 56 is written in the position of 60.48 inches, which is equal to 56×1.08 . Similarly, 60 is written in the position of 64.80, which is equal to 60×1.08 .

In the actual machine the weights run in grooves. It is also

taller and has a longer scale than is shown in the figure, which is somewhat shortened for want of space.

Plate X. This is a diagram based on Table I. The figures in it were first "smoothed" as described in the memoir, then lines were drawn through points corresponding to the same values, just as isobars or isotherms are drawn. These lines, as already stated, formed ellipses. I have also explained how calculation showed that they were true ellipses, and verified the values I had obtained of the relation of their major to their minor axes, of the inclination of these to the coordinates passing through their common centre, and so forth. The ellipse in the figure is one of these. The numerals are not directly derived from the smoothed results just spoken of, but are rough interpolations so as to suit their present positions. It will be noticed that each horizontal line grows to a maximum and then symmetrically diminishes, and that the same is true of each vertical line. It will also be seen that the loci of maxima in these follow the lines *ON* and *OM*, which are respectively inclined to their adjacent coordinates at the gradients of 2 to 3, and of 1 to 3. If there had been no regression, but if like bred like, then *OM* and *ON* would both have coincided with the diagonal *OL*, in fig. *a*, as shown by the dotted lines.

I annex a comparison between calculated and observed results. The latter are inclosed in brackets.

Given—

"Probable error" of each system of mid-parentages = 1.22.

Ratio of mean filial regression = $\frac{2}{3}$.

"Probable error" of each system of regressed values = 1.50.

Sections of surface of frequency parallel to *XY* are true ellipses.

[Obs.—Apparently true ellipses.]

MX : *YO* = 6 : 17.5, or nearly 1 : 3.

[Obs.—1 : 3.]

Major axes to minor axes = $\sqrt{7} : \sqrt{2} = 10 : 5.35$.

[Obs.—10 : 5.1.]

Inclination of major axes to *OX* = $26^{\circ} 36'$.

[Obs.— 25° .]

Section of surface parallel to *XY* is a true curve of frequency.

[Obs.—Apparently so.]

"Probable error" of that curve = 1.07.

[Obs.—1.0 or a little more.]

The DOLMENS of BRITTANY.

THE following remarks by Mr. A. L. LEWIS on Admiral Tremlett's paper on "The Sculptured Dolmens of Brittany" should have appeared at page 113 of the last number of the "Journal":—

Mr. LEWIS said the Institute was fortunate in receiving papers on this subject from Admiral Tremlett, since he had not only spent much time in each of a number of years on the spot, but had inherited the "unexhausted improvements" of his brother-in-law, the late James Miln. It was very remarkable that the inscribed dolmens should be contained in so small an area while there were so very many uninscribed ones outside that area. The suggestion that they had been built or had been ornamented by people landing casually was not tenable, for the ornaments had, in some cases at least, been cut on the stones before they were placed in position, and, except the ornamentation, there was no difference between those and the other dolmens; the suggestion that this area was inhabited by a special tribe did not commend itself to his mind, and he thought it more likely that these dolmens were the tombs of persons of a special rank or class. While it was possible that the custom of erecting dolmens and menhirs might very occasionally have been continued into and even beyond Roman times, the things found in them were almost without exception Celtic, and included very large quantities of stone implements. The country appeared to be full of Roman remains, but these were on the top of the mounds, and Mr. Miln had found Roman walls built over fallen menhirs in the middle of an alignment, proving the pre-Roman date of the alignments beyond the possibility of doubt. Mr. Miln's sumptuous book, containing the details of this discovery, had been placed by Admiral Tremlett in the library of the Institute, so that it could be consulted by any member.

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OF
GREAT BRITAIN AND IRELAND.

JUNE 23RD, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From LORD ARTHUR RUSSELL, M.P.—Correspondence relating to the Native Population of Fiji.
- From the UNITED STATES GEOLOGICAL SURVEY.—The Copper-Bearing Rocks of Lake Superior. By Roland Duer Irving.
- From the AUTHOR.—Les Derniers Voyages des Néerlandais à la Nouvelle-Guinée. By Prince Roland Bonaparte.
- Les Récents Voyages des Néerlandais à la Nouvelle-Guinée. By Prince Roland Bonaparte.
- Remarks upon Chipped Stone Implements. By F. W. Putnam.
- The First Notice of the Pine Grove or Forest River Shell-heap. By F. W. Putnam.
- Les Primitifs. By Elie Reclus.
- The Iroquois Book of Rites. By Horatio Hale, M.A.
- From the ACADEMY.—Atti della Reale Accademia dei Lincei. Serie Quarta. Vol. I, Fas. 12.
- Boletín de la Accademia Nacional de Ciencias en Córdoba. Tomo VII, Entrega 4.
- From the INSTITUTION.—Journal of the Royal United Service Institution. No. 129.

From the SOCIETY.—Transactions of the Geological Society of Glasgow. Vol. VII, Part 2.

— Journal of the Society of Arts. Nos 1699, 1700.

— VI-VII. Jahresbericht des Vereins für Erdkunde zu Metz für 1883-1884.

From the EDITOR.—The American Antiquarian. Vol. VII, No. 3.

— L'Homme. 1884. No. 11.

— Matériaux pour l'Histoire de l'Homme. June, 1885.

— The Museum. Vol. I, No. 2.

— "Nature." Nos. 815, 816.

— "Science." Nos. 121, 122.

The election of the following new Members was announced :—

LADY BRASSEY; Dr. ROBERT BROWN, M.A.; Colonel T. CADELL, V.C.; C. HEAPE, Esq.; H. H. JOHNSTON, Esq.; D. MACRITCHIE, Esq.; Professor H. N. MOSELEY, F.R.S.; MISS NORTH; and C. SEIDLER, Esq.

LADY BRASSEY exhibited a large collection of objects of ethnological interest from Polynesia.

MISS NORTH exhibited several ethnological specimens from New Ireland.

Mr. CARL LUMHOLTZ exhibited a series of Australian implements.

The following paper was read by the author, and illustrated by an exhibition of objects made by the Solomon Islanders :—

On the PHYSICAL CHARACTERS of the SOLOMON ISLANDERS. By H. B. GUPPY, M.B., F.G.S., late Surgeon of H.M.S. "Lark."

THESE observations, which were made between 1881 and 1884, were confined for the most part to the natives of the opposite extremities of the group, at the eastern extremity to the natives of St. Christoval and of the adjoining small islands of Ugi, Santa Anna, and Santa Catalina, and towards the opposite extremity to the natives of the islands of Bougainville Straits, which include Treasury Island, the Shortland Islands, Faro Island, together with Choiseul Bay. Observations, although fewer in number, were also made on the natives of the following intermediate islands, viz., Malayta, the Florida Islands, and Simbo or Eddystone Island.

All the measurements, unless otherwise stated, refer to male adults: and with these preliminary remarks, I will at once proceed to describe the physical characters in their order.

Stature.

Height in feet and inches.	Number of Measurements.
4 feet 11½ inches to 5 feet 0 inches.	2
5 " 0 " 5 " 1 "	5
5 " 1 " 5 " 2 "	6
5 " 2 " 5 " 3 "	13
5 " 3 " 5 " 4 "	18
5 " 4 " 5 " 5 "	9
5 " 5 " 5 " 6 "	10
5 " 6 " 5 " 7 "	6
5 " 7 " 5 " 8 "	2
5 " 8 " 5 " 8½ "	1
Total	72

The foregoing table includes all the measurements of height which I obtained in the various parts of the group. The range of these 72 measurements is 4 feet 11½ inches to 5 feet 8½ inches. Fifty of these are gathered together between 5 feet 2 inches and 5 feet 6 inches. Arranging the whole series in order I find that the value of the central number (36th) is 5 feet 4 inches; of the quarter-points, the value of the 18th is 5 feet 3 inches and of the 54th 5 feet 5½ inches; and the values of the 9th and 63rd in the scale are 5 feet 1¼ inches and 5 feet 6 inches respectively. There is a disturbing element in this series, which is probably the result of combining in the same series the natives of the Bougainville Straits islands and those of St. Christoval, the latter being rather shorter as noticed below. We may, however, take the value of the median as representing the average height of a native of the Solomon Islands, viz., 5 feet 4 inches or 1.625 mètres, which is somewhat below the medium height of the human race as stated by Topinard at 1.65 mètres. It is however, in a marked degree in excess of the height which Mayer gives for the Papuans, viz., 1.536 mètres (*vide* Topinard's "Anthropology").

Deviations of a constant character are found in different parts of the group, and often in different districts of the same island. The natives of the islands of Bougainville Straits, for instance, are noticeably taller than those of St. Christoval at the opposite end of the group, the averages of about thirty measurements in each region differing by from one-half to three-quarters of an inch. This difference in height in these two localities is accompanied by other important changes in the physical characters which will be subsequently referred to.

The range of my measurements may be contrasted with those

obtained by Miklukho-Maclay on the coast of New Guinea (*vide* "Nature," December 7th, 1882).

Papua-Koriak coast	..	..	..	1.75 to 1.48 mètres.
Maclay coast	..	..	..	1.74 „ 1.42 „
Solomon Islands	..	..	..	1.74 „ 1.51 „

Chest-Girth.

The range of the eighteen measurements given in the sub-joined table is $31\frac{1}{2}$ to 37 inches: and since half of these are included between 34 and 35 inches, we may consider these as the limits of the average chest-girth of the natives in the portions of the group in which the measurements were made, viz., the islands of Bougainville Straits, and St. Christoval with its adjoining islands.

Girth in inches.	Number of Measurements.	Stature taken as 100.
$31\frac{1}{2}$ to 32	1	50 .. 1
32 „ 33	3	52-53 .. 3
33 „ 34	3	53-54 .. 7
34 „ 35	9	54-55 .. 3
35 „ 36	0	55-56 .. 2
36 „ 37	2	56-57 .. 1
	—	57.2 .. 1
Total 18		Total .. 18

Taking the average height 5 feet 4 inches as 100, the proportion which a chest-girth of $34\frac{1}{2}$ inches would bear would be 53.9. This very closely corresponds with the values of the median of the accompanying series, which itself agrees with the value of the average of the indices. This index of chest-girth may be compared with results given by Topinard:

Englishmen	..	..	..	..	..	54.0
Negroes	..	..	..	..	..	52.3
New Zealanders	..	..	..	..	..	51.4
Solomon Islanders	..	..	..	..	..	53.9

Weight of Body.

Twelve natives of the Shortland Islands were taken promiscuously and weighed, the following being the results stated in lbs.:—100, 103, 116, 117, 120, 120, 123, 130, 148, 148, 150, 154. The mean of these numbers is 127; and the average weight would probably vary between 125 and 130 lbs., or between 57 and 59 kilogrammes. This probable average weight is quite in accordance with the size and build of a typical Solomon Island native, and agrees with the general rule that the

weight in lbs. ought to be about twice the height in inches; the average height being 64 inches, and the average weight 125 to 130 lbs.

Length of Limbs.

The points of measurement employed were—

- (a) *For the upper extremity*: (1) a point half an inch outside and on a level with the apex of the coracoid process of the scapula; (2) the centre of the hollow of the elbow on a line drawn from the interspace between the head of the radius and the external condyle of the humerus (indicated by a dimple when the forearm is extended) to immediately below the internal condyle; (3) the centre of a line joining the apices of the styloid processes of the radius and ulna on the front of the wrist.
- (b) *For the lower extremity*: (1) a point on the middle of the front of the thigh on a level with another point midway between the anterior superior spinous process of the ilium and the upper edge of the great trochanter; (2) a point on the "ligamentum patellæ" on a level with the upper edge of the external tuberosity of the tibia; (3) the centre of the front of the ankle on a level with the base of the internal malleolus.

1. *The intermembral index*, or the ratio between the lengths of the upper and lower limbs, taking the latter as 100. From the table subjoined it will be seen that the range of 26 indices is 64 to 73. Eleven of these lie between 67 and 68; and since the average of my numbers, which is 68, corresponds with the value of the median of the series, we will take this index of 68 as representing the average ratio of the lengths of the two limbs compared together.

Intermembral Index.	Number of Measurements.	Intermembral Index.	Number of Measurements.
64	1	69	3
65	2	70	1
66	3	71	3
67	6	72	1
68	5	73	1
			—
			Total 26

2. *The index of the forearm and arm*, or the ratio between the lengths of the forearm and arm, taking the latter as 100. The range of 27 indices is 79 to 100. Of these, 16 are included between 87 and 91, and the average of the numbers is 88.

Indices.	Number of Measurements.	Indices.	Number of Measurements.
79	1	87	6
80	1	88	2
82	2	89	1
83	2	91	7
84	1	95	1
86	1	100	2
			—
			Total 27

3. *The index of the leg and thigh*, or the ratio between the lengths of the leg and thigh, taking the latter as 100. The range of 27 indices, as shown in the subjoined table, is 68 to 97. Of these two-thirds are included between 74 and 83: and since the value of the median, which is 80, corresponds nearly with the average of the numbers, we may take it as representing the average proportion which the leg bears to the thigh amongst these natives.

Indices.	Number of Measurements.	Indices.	Number of Measurements.
68	1	80	3
69	1	81	2
70	1	82	2
72	1	83	4
73	1	88	3
74	2	92	1
75	2	97	1
78	1		—
79	1		Total 27

4. *The index of the arm and thigh*, or the ratio between the lengths of the arm and thigh, taking the latter as 100. The range of 27 indices is 56 to 73. Of these three-fourths are grouped between 61 and 69. The average of the figures is 65, and the median of the series is 66.

Indices.	Number of measurements.	Indices.	Number of Measurements.
56	1	66	3
57	1	67	4
60	1	69	3
61	2	70	1
62	2	71	1
63	3	73	2
64	2		—
65	1		Total 27

5. *The proportion of the length of the upper limb to the height of the body, taking the latter as 100.*

Indices.	Number of Measurements.
32	1
32-33	10
33-34	10
34-35	4
35-36	2
	—
	Total 27

These 27 indices range between 32 and 36; three-fourths of them are included between 32 and 34. Since the average of the numbers, which is 33.3, nearly corresponds with the value of the median, we may take it as representing the proportion which the length of the upper limb bears to the height of the body amongst these natives.

6. *The proportion of the length of the lower limb to the height of the body, taking the latter as 100.* The range of these 27 indices is 46.9 to 51.6. Two-thirds of the total number are included between 48 and 50; and since the average of the numbers, which is 49.1, corresponds nearly with the value of the middle index of the series, we may take it as representing the proportion that the lower limb usually bears to the height of the body amongst these natives.

Indices.	Number of Measurements.
46.9	1
47-48	4
48-49	8
49-50	10
50-51	3
51.6	1
	—
	Total 27

7. *The span of the outstretched arms.*—The following indices, 69 in all, show the ratio of the span of the arms to the height of the body, taking the latter as 100 :—

Indices.	Number of Measurements.	Indices.	Number of Measurements.
100	1	107-108	11
101-102	4	108-109	6
102-103	2	109-110	9
103-104	4	110-111	3
104-105	5	112·6	1
105-106	5		—
106-107	18		Total 69

The range of these indices is 100 to 112·6; and the indices of greatest frequency are those included between 106 and 107. Placing all the indices in their order, I find that the value of the central of the series is 106·7, and of the quarter-points 105·2 and 108·6 respectively. Taking 106·7 as representing the average proportion which the span of the arms bears to the stature amongst these natives, I may compare it with similar results given for other races in Topinard's "Anthropology."

American soldiers (10,876)	=	104·3
Solomon Islanders (69) ..	=	106·7
Negroes (2,020)	=	108·1

8. *Distance of the tip of the middle finger from the upper edge of the patella.*

Distance.	Number of Measurements.
2 inches.	2
2 to 3 "	6
3 " 4 "	11 (9 of these at 3½ inches).
4 " 5 "	2
	—
	Total 21

From this table it will be seen that amongst twenty-one natives the tip of the finger never approached the patella nearer than 2 inches, and was never farther removed than 5 inches. The value of greatest frequency is 3½ inches, and it may be taken as approximating the average distance. Comparing it with the average stature (64 inches) taken as 100, we obtain the index 5·46.

By comparing the distance of the middle finger above the patella with the stature as 100 in each individual measurement, we obtain a more reliable average index somewhat smaller than the preceding.

Indices.	Number.
3·12-4·00	4
4·00-5·00	5
5·00-6·00	9
6·00-7·00	1
7·00-7·94	2
	Total 21

In this table the indices range between 3·12 and 7·94; nearly half are included between 5·00 and 6·00; the value of the median is 5·24, and the average of the numbers is 5·19. Accepting the value of the median as our average index for these natives, it may be compared with similar results for other races given in Topinard's "Anthropology."

American soldiers (10,876)	= 7·49.
Negroes (2,020) ..	= 4·37.
Solomon Islanders (21) ..	= 5·24.

I will conclude my remarks on the length of the limbs by giving from the preceding data, the limb measurements of a Solomon Island native of average height.

Intermembral index, 68.	Height of body ..	= 64 inches	} Index of height, and length of upper limb, 33·3.
	Length of upper limb = 21½	"	
	" arm ..	= 11½ "	} Index of arm and forearm, 88.
	" fore-arm = 10	"	
	" lower limb = 31½	"	} Index of height, and length of lower limb, 49.
	" thigh ..	= 17½ "	
	" leg ..	= 14 "	} Index of thigh and leg, 80.

The form of the skull, as indicated by the relation to each other of its length and breadth.—In the following table are arranged the cephalic indices obtained from the measurement of 100 individuals belonging to various parts of the group, viz., St. Christoval and its adjoining small islands of Ugi, Santa Anna, and Santa Catalina; Malayta; the Florida Islands; Simbo or Eddystone Island; and the islands of Bougainville Straits, which include Treasury Island, the Shortland Islands, Faro Island, and the adjoining west end of Choiseul. The bulk of the observations, however, were made amongst the islands of Bougainville Straits, and in the island of St. Christoval and its adjacent smaller islands, localities which lie at opposite extremities of the group.

In this series, which ranges from 69·2 to 86·2, there is a want of uniformity arising from the fact that the numbers tend to gather around three centres, one between the indices 75 and 76,

another between the indices 80 and 81, and the third between the indices 82 and 83. We have thus in this series of a hundred indices, obtained by measurement of the head of the living subject, evidence of different prevailing types of skull amongst the natives of the Solomon group; and it will be subsequently shown that each locality has usually one prevailing type.

Cephalic Indices.	Number of Measurements.	Cephalic Indices.	Number of Measurements.
69·2 to 70	2	78 to 79	11
70 " 71	1	79 " 80	12
72 " 73	3	80 " 81	16
73 " 74	3	81 " 82	7
74 " 75	6	82 " 83	10
75 " 76	8	83 " 84	7
76 " 77	6	85 " 86	1
77 " 78	6	86 " 86·2	1
		Total 100	

1. *St. Christoval and the adjoining islands of Ugi, Santa Anna, and Santa Catalina.*—As shown in the subjoined table, this series of 35 indices has a wide range between 69·2 and 86·2. The value of the median index of the series is 75·9; and the average of the numbers is 76·6. Out of the 35 indices, 11 are included between 74 and 76. On the whole, however, I should take 76 as representing the average cephalic index in this part of the group, although even here, as shown in the series, there is some disturbing element.

Cephalic Indices.	Number of Measurements.	Cephalic Indices.	Number of Measurements.
69·2 to 70	2	77 to 78	2
70 " 71	1	78 " 79	4
72 " 73	2	79 " 80	3
73 " 74	2	80 " 81	1
74 " 75	6	82 " 83	2
75 " 76	5	83 " 84	1
76 " 77	3	86 " 86·2	1
		Total 35	

2. *The islands of Bougainville Straits*, which include Treasury Island, the Shortland Islands, Faro Island, and the western extremity of Choiseul.

The range of the subjoined 40 indices is 75·9 to 85·2. The contrast between this and the preceding *St. Christoval* series, as shown in the grouping of the indices, well illustrates the

prevalence of distinct types in these two regions of the group. The indices of greatest frequency are included between 80 and 81; the average of the figures is 80·6, and the value of the typical median index is 80·7, which may be accepted as the index.

Cephalic Indices.	Number of Measurements.	Cephalic Indices.	Number of Measurements.
75·9 to 76	2	80 to 81	9
76 " 77	1	81 " 82	5
77 " 78	2	82 " 83	5
78 " 79	6	83 " 84	6
79 " 80	3	85 " 85·2	1
		Total	40

3. *The north coast of Malayta.*—Through the kindness of the Hon. Curzon Howe, Government Agent of the labour-schooner "Lavina," I was enabled to measure ten natives who had been recruited from the districts of Urasi and the Uta Pass on the north coast of Malayta.

Cephalic Indices.	Number of Measurements.
79·3 to 80	2
80 " 81	4
81 " 82	1
82 " 83	3
	Total 10

This series, although small, is compact, its range being 79·3 to 83. The average of the numbers is 81·2, which I will take as typical of these localities.

4. *The island of Simbo or Eddystone.*—From the head-measurements of nine natives I obtained the following cephalic indices:—72·9, 73·8, 75·8, 76·6, 77·0, 78·0, 78·7, 79·3, 80·4, the average of which just falls short of 77, which, however, may be taken as an approximation of the prevailing index.

5. *The Florida Islands.*—Measurements of six natives of Mboli Harbour gave the following cephalic indices:—77·2, 79·3, 79·3, 80·0, 80·7, 81·4, the average of the numbers being 79·6.

I will now proceed to sum up briefly the results of the foregoing hundred measurements of the head of the living subject. It will first be necessary to reduce them to the form of measurements of the actual skull by subtracting two units from the

index as proposed by M. Broca. The effect of this correction is shown in the following table:—

	Number of Measurements.	Living subject.	Skull.
St. Christoval and adjoining islands ..	35	76·0	74·0
The Islands of Bougainville Straits ..	40	80·7	78·7
The north coast of Malayta.. ..	10	81·2	79·2
The Island of Simbo or Eddystone.. ..	9	77·0	75·0
The Florida Islands	6	79·6	77·6

Accepting all indices below 75 as dolichocephalic, those between 75 and 80 as mesocephalic, and those above 80 as brachycephalic, we find, therefore, that mesocephaly, as represented by an average index of 78·7, prevails amongst the natives of the islands of Bougainville Straits; whilst dolichocephaly, as represented by an average index of 74, prevails amongst the natives of St. Christoval and its adjoining islands at the opposite end of the group. On the north coast of Malayta exists a type of native with an almost brachycephalic index. The foregoing remarks refer only to the average in each locality. When we apply the same correction to the table of the hundred measurements as given on page 274, we find that—

29 are dolichocephalic.

52 „ mesocephalic.

19 „ brachycephalic.

100

It is clear, therefore, that brachycephaly is not uncommon amongst the natives of these particular islands. Dolichocephaly is, however, more frequent. But mesocephaly prevails. Future observers must decide whether it prevails through the whole group.

As confirmatory of the foregoing corrected measurements of the head of the living subject, I will add the indices of nine skulls, mostly female, procured amongst the eastern islanders of the group.

74·1	}	Rua Sura Islets off north coast of Guadalcanar.
74·1		
74·1		Ugi Island.
74·5		Port Adam, Malayta.
75·5	}	Ugi Island.
75·9		
80·0		
80·0		
84·9		Kwahkwahru, Malayta.

The Features.

The facial angle taken was that between a line dropped from the forehead to the alveolar border of the upper jaw, and another line drawn from the external auditory meatus through the central axis of the orbit, the angle being taken with a goniometer. Amongst eighty natives from different parts of the group, the angle varied between 87° and 98° . Seventy-five of the natives had facial angles between 90° and 95° , and the average of the whole number of angles was 93° . On applying the method for obtaining the facial angle of Cloquet to two large photographs of the faces in profile of two typical natives, I find the angles to be 63° and 67° respectively.

The common characters of the features may be thus described:—face rather angular, with often a beetle-browed aspect from the deeply sunk orbits and projecting brows; forehead of moderate height and breadth, and somewhat flattened; middle of face rather prominent on account of the chin receding; moderate subnasal prognathism as indicated by Cloquet's facial angles of 63° and 67° ; lips rather thick and often projecting; nose usually coarse, short, straight, and much depressed at the root, with broad nostrils and extended alæ; in about one man out of five the nose is arched in a regular curve, giving a Jewish cast to the face.

The Hair.

Amongst the natives of the Solomon group there are four common styles of wearing the hair, which I may term the woolly, the mop-like, the partially bushy, and the completely bushy; these prevail with both sexes, the fashion varying in different islands. From frequent observation of the different modes of wearing the hair, I am of the opinion that their variety is to be attributed more to individual fancy than to any difference in the character of the hair. According to his taste, a man may prefer to wear his hair close and uncombed, when the short matted curls with small spiral give it a woolly appearance, somewhat resembling that of the hair of the African negro. Should he allow his hair to grow, making but little use of his comb, the hair will hang in narrow ringlets 3 to 8 inches in length, a mode which is more common amongst the natives of the eastern islands of the group, being best described as the "mop-headed" style. More often, from a moderate amount of combing, the locks are loosely entangled, and the hair-mass assumes a somewhat bushy appearance, the arrangement into locks being still discernible and the surface of the hair presenting a tufted aspect. The majority of natives, however, produce by

constant combing a bushy periwig in which all the hairs are entangled independently into a loose frizzled mass, the separate locks being no longer discernible. Of these four styles of wearing the hair, I am inclined to view the "mop-headed" style as the result of the natural mode of growth, it being the one which the hair would assume if allowed to grow uncombed and uncut. The Solomon Islander, unfortunately, makes such a constant use of his comb that one rarely sees his hair as nature intended it to grow.

When, however, a man with bushy hair has been diving for some time, the hairs disentangling themselves to a great extent, gather together into long narrow ringlets—nature's "coiffure" of the Solomon Island native.

The hue of the hair in adults varies usually in accordance with the changes in the colour of the skin. Amongst the St. Christoval natives it agrees with the numbers 35 and 42 of the colour-types of M. Broca; whilst amongst the darker-hued natives of the islands of Bougainville Straits the hair is of a deeper hue, corresponding with the colour-types 34 and 49. The average thickness of eleven samples of hair from the former locality is from $\frac{1}{16}$ to $\frac{1}{8}$ of an inch; whilst in the latter locality, where the hair is of a darker hue, the hairs are individually coarser, ten samples giving an average thickness of $\frac{1}{16}$ to $\frac{1}{8}$ of an inch. The diameter of the spiral, when measurable, varies between 5 and 10 millimètres, its usual range throughout the group; but on account of the practice of combing, it is often difficult to measure it with any degree of accuracy.

I have not yet referred to the almost straight-haired element which has been infused amongst the inhabitants of the islands of Bougainville Straits. The individuals thus characterised have very dark skins, the hair being even darker and corresponding in hue with the colour-types 34 and 49. With such natives—whose faces, I should add, are flatter and the noses more *écrasés* than usual—the hair is almost straight, often erect, and giving the person a shock-headed appearance: whilst it may in some cases tend to gather into curls of a large spiral. Other natives possess hair which combines the straight and frizzly characters, giving the whole mass an appearance partly wavy and partly bushy. Small boys in this part of the group have frequently curly heads of hair with large flattened spirals. Traders tell me that straight-haired individuals are found amongst the hill-tribes of St. Christoval at the opposite end of the group: I met with one such native near Cape Keibeck, on the north coast of that island.

Amongst the natives of the eastern islands of the group the

hair is often stained a light-brown hue by the use of lime, a practice which frees the hair of vermin. The passing visitor might easily carry away with him the idea that such light-brown hair was a permanent character of these islanders; but on examination of adults he would usually find that the hair is much darker at the roots. The natives of the islands of Bougainville Straits—more generally the women and children—stain their hair by the use of a red ochreous earth, the colour of which, blended with the deep colour of the hair, produces a striking magenta hue.

With regard to the amount of hair on the face, limbs, and body, great diversity is observed, even amongst natives of the same village. Epilation is commonly employed; but there can be no doubt that the development of the hair varies quite independently of such a custom. Out of ten men taken promiscuously from one of the villages on the north coast of St. Christoval, perhaps five would have smooth faces; three would possess a small growth of hair on the chin and upper lip; the ninth would wear a beard, a moustache, and whiskers of moderate growth; whilst the tenth would present a shaggy beard and a hairy visage. With the majority of the Solomon Islanders, the surfaces of the body and limbs are comparatively free from hair; but hairy men are to be met with in most villages, and on one occasion in the vicinity of Cape Surville, the eastern extremity of St. Christoval, I visited a village where the proportion of the hairy-bodied, hairy-visaged men was in excess of the smooth-skinned element. Hairy visages are more commonly found amongst the natives of the Florida Islands. Amongst the natives of the islands of Bougainville Straits, it is usual for the chiefs and old men to grow a straggling scanty beard; the great bulk of the men, however, keeping their faces and chins free from hair. It would appear that in this group the qualities of treachery and ferocity are possessed in a greater degree by those communities in which hairy men prevail.

*The Colour of the Skin.*¹

In different parts of the Solomon group the colour of the skin varies considerably in shade from a very deep brown, exemplified by colour-type 42 of M. Broca, to a copperish hue best typified by colour-type 29. The darker shades I found to prevail amongst the natives of the islands of Bougainville Straits, where they correspond generally with the types 35 and

¹ The colour-types employed were those which are given in the "Anthropological Notes and Queries," published by the British Association in 1874.

42. The populations of St. Christoval and the adjoining islands have a somewhat lighter hue, corresponding more with the colour-types 35 and 28. One occasionally meets, however, amongst the prevailing dark hues with those of a much lighter copperish shade which corresponds with type 29. In the small island of Santa Catalina, which lies off the eastern extremity of St. Christoval, there is a large proportion of light-coloured individuals. This lighter hue of the skin is also frequent amongst the natives of the district on the north coast of Guadalcanar, which lies opposite the Rua Sura Islets.

The elderly natives are, as a rule, more dark-skinned than those of younger years, the difference in shade being attributable partly to a longer exposure by reason of their age to the influence of sun and weather, and partly to those structural changes in the skin which accompany advancing years. The colour is usually fairly uniform over the person; but amongst ten natives from the districts of the Uta Pass and Urasi, on the north coast of Malayta, the majority had their chests and faces of a lighter hue than their limbs and body, the difference being represented by that between 28 and 35 of the colour-types. I was unable to ascertain the cause of this difference.

Not unfrequently, amongst a group of dark-skinned natives a man may be observed whose skin is of a pale sickly hue, and who at the first glance may be thought to afford an example of recent intermingling of the Pacific races. On a closer examination, I always found that such men were covered from head to foot with an inveterate form of body-ringworm—a scaly skin eruption which probably affects in a greater or less degree two-fifths of the population of the Solomon group—and that in all their other physical characters they belonged to the Melanesian type. In its most aggravated and chronic condition this parasitical disease implicates the skin to such a degree that the rapid desiccation and desquamation of the epidermal cells lead to a partial decoloration of the deeper parts of the cuticle, as though the rate of the production of pigment was less rapid than the rate of its removal in the desquamative process. So prevalent is this disease in the island of Treasury, that four-fifths of the inhabitants are thus affected, and half of the chief's wives, who number between twenty-five and thirty, are covered with the eruption over limbs and trunk.

The Physical Characters of a Typical Solomon Islander.

Notwithstanding the variety in some of the characters of these natives, it is not a difficult matter to describe a typical individual who combines their most prominent and most

prevalent characteristics. Such a man would have a well-proportioned physique, a good carriage, and well-rounded limbs. His height would be about 5 feet 4 inches; his chest-girth between 34 and 35 inches; and his weight between 125 and 130 lbs. The colour of his skin would be a deep brown, corresponding with number 35 of the colour-types of M. Broca: and he would wear his hair in the style of a bushy periwig in which all the hairs are entangled independently into a loose frizzled mass. His face would have a moderate degree of subnasal prognathism, with projecting brows, deeply sunk orbits, short straight nose much depressed at the root, but sometimes arched, lips of moderate thickness and rather prominent, chin somewhat receding. His hairless face would have an expression of good humour, which is in accord with the cheerful temperament of these islanders. The form of his skull would be probably mesocephalic. The proportion of the length of the span of the extended arms to the height of the body, taking the latter as 100, would be represented by the index 106·7. The length of the upper limb would be exactly one-third the height of the body; and the tip of his middle finger would reach down to a point about $3\frac{1}{2}$ inches above the patella. The length of the lower limb would be slightly under one-half ($\frac{49}{100}$) of the height of the body; and the relations of the lengths of the upper and lower limbs to each other would be represented by the intermembral index 68.

Conclusion.

In conclusion, before referring to some of the remaining features of this paper, I would draw attention to the circumstance of my observations being confined to the coast tribes of this group. The larger islands, which may be compared in size to the county of Cornwall, are but thinly populated in their interior by tribes of more puny physique and less enterprising character, who are ill-suited to cope with their more robust and more warlike fellow-islanders of the coast. These bush-men, as they are called, are accredited by the coast natives with inferior mental capabilities as compared with their own. To call a man of the coast a bush-man is equivalent to calling him a stupid or a fool, a taunt which is commonly employed amongst the natives of the coast. The stone adzes and axes which have been discarded by the inhabitants on the coast are still employed by these bush-men. I was unable to make any measurements of these natives; but those I saw were usually shorter and of more savage aspect. They will probably be found to present purer Papuan characters than their fellows of the coast, with whom they wage an unceasing warfare.

The following are some of the leading points of this paper:—

1. Two constant variations in the type of the Solomon Island native are presented by the natives of the islands of Bougainville Straits, and the natives of St. Christoval and its adjoining islands at the opposite end of the group. In the former locality there exists a taller, darker, and more brachycephalic race; whilst in the latter locality the average native is shorter, of a lighter hue, and his skull has a more dolichocephalic index.

—	Average Height.	Colour of Skin.	Cephalic Index of living subject.
	ft. in.		
St. Christoval	5 3½	Colour-types 35 and 28 ..	76
Bougainville Straits ..	5 4¼	" 35 " 42 ..	80·7

2. Amongst the natives of the islands of Bougainville Straits there is an infusion of a straight-haired element, characterised by hair almost black, and often by more flattened features.
3. The colour of the skin varies considerably in different parts of the group, and often in the same district, the range being represented by the colour-types 29 and 42 with intermediate shades.
4. A hundred measurements of the heads of natives give indices varying between 69·2 and 86·2; the whole series, however, displays a tendency to grouping around different medians, and thus points to the important inference that we cannot accept one type of the skull as a distinctive character of the Solomon Islander. There is, however, a marked preponderance of mesocephaly as shown in the table on page 276, which gives the indices corrected to actual skull measurements; but from my measurements being limited both in number and locality, I think the safest conclusion to draw is the most general one, viz., that all types of skulls, brachycephalic, mesocephalic, and dolichocephalic, are to be found prevailing amongst the natives of the Solomon group, the particular type being often constant in the same locality. If my measurements had been five times as numerous, and spread equally over the group, I might somewhat narrow my conclusions; and the perusal of my paper will show that brachycephaly might have formed a

more important factor in the series if I had measured the heads of the same number of natives from the north coast of Malayta which I measured in the districts of St. Christoval and of Bougainville Straits.

APPENDIX.

Measurements of Women.—I was only able to obtain measurements of six women, all of them from the small islands of Ugi and Santa Anna, off the St. Christoval coast.

Height.	Span of Arms. (Stature = 100)	Intermembral Index.	Distance between middle finger and patella.
ft. in.			Inches.
4 8	100·8	65	3½
4 9	102 1	68	3½
4 9½	104·3	68	4
4 10	104·7	71	—
5 0	106·9	—	Average 3½
5 3	108·3	Average 68	
Average 4 10½	104·5		

Arm and Height Index.	Leg and Height Index.	Cephalic Index.
32·5	48·5	71
33	48·5	75
33	50	76·8
33·5	51·5	76·8
34·5	—	79·6
35·5	Average 49·6	82·1
Average 33·7		

Considering the paucity of the observations, the average indices of the limb-measurements agree closely with those obtained for the men. The average height of the women would appear from these few observations to be that which they ought to possess as compared with the height of the men. This conclusion is based on the rule given by Topinard in his "Anthropology," that for a race of this stature 7 per cent. of the height of the man must be subtracted to obtain the true proportional height of the woman.

DISCUSSION.

The PRESIDENT, Mr. C. ROBERTS, Miss BUCKLAND, Mr. KERRY-NICHOLLS, Dr. GARSON, and Mr. OLDFIELD THOMAS joined in a discussion on Dr. Guppy's paper.

The AUTHOR, in reply to an inquiry of the President as to whether the labour traffic exercised a salutary or an injurious influence on the natives of the Solomon Islands in favouring or placing at a disadvantage those men who had worked on the colonial plantations, said he was not able to say whether such men were affected as to the length of their lives, or to the proneness to disease, but he should be inclined to the opinion that men who *do* return to their villages after an absence of three years in Fiji or Queensland would acquire in some degree a greater hardihood and greater pliability of constitution, which would give them an advantage over their fellows who remain all their lives in the same locality. In reply to Mr. Thomas, who referred to the author's estimate of the average height of a Solomon Island native as rather less than that which he would have judged it to be from the size of some skulls of these natives which Mr. Guppy had sent to the British Museum, the speaker pointed out that the range of his measurements extended over seventy in number, and referred to their arrangement in series as supporting his conclusion. In answer to some remarks by Dr. Garson, he observed that in his paper the expressions "Papuan" and "Polynesian" did not often occur, as he was desirous rather of collecting facts than of drawing conclusions, since his experience had been confined only to one of the many Pacific groups. Some of his conclusions, however, stood rather in opposition to views generally held; thus he found the colour of the skin and the form of the skin had no correlation—an experience which he believed was in conformity with that of Baron Miklukho Maclay in the Melanesian Islands. As regards the growth of the hair, Dr. Guppy found nothing to support the view that it grows in clusters from the scalp with hairless intermediate spaces. The bushy periwig he believed to be an artificial and not natural condition of the hair, the hair in its natural condition hanging in long narrow ringlets with a small diameter of spiral. The hair in many islands is stained a light brown colour by the use of lime, whilst in other islands a red ochreous earth is used, which, combining with the deep colour of the hair, produces a curious magenta tint. Mr. C. Roberts, having referred to the visit of Mr. C. F. Wood to the Solomon group in his yacht in 1873, asked the author whether he could confirm Mr. Wood's impression that there were signs of an older and somewhat higher state of the arts in those regions, instancing the skill shown in their large canoes as inconsistent with the present condition of the natives. Dr. Guppy remarked, in reply, that he had read Mr. Wood's account of his short visit to St. Christoval with interest, but had observed nothing to support such an impression. One would naturally expect, however, that in this borderland between the Polynesian and Papuan races there would

be a certain degree of incongruity from the mingling of two races in such different degrees of advancement.

MR. HYDE CLARKE then read a paper entitled "Observations on the Mexican Zodiac and Astrology," which was discussed by M. BERTIN and Professor KEANE.

The following papers were taken as read :—

On the SAKAIS. By ABRAHAM HALE, Esq.

[WITH PLATES XI to XIII.]

THE Malays contemptuously call the Sakais *Orang-utan*, "men of the woods," or *Orang-bukit*, "men of the hills"; and unless they happen to be foreign Malays, that is to say, from any of the Islands, they speak of themselves as *Orang-darat*, "men of the country." The Sakais, on the other hand, say that *they* are *Orang-darat*, and I suppose there can be no doubt that the Sakais were more original inhabitants of the peninsula than the Malays from which it takes its name; but whether there are living at the present time any representatives of a yet earlier race inhabiting this country I do not feel at all certain.

In this State of Perak there is at present besides the Sakais one other race, the Sēmang, probably of equal antiquity. As a general rule the Sakai race inhabits the left bank of the Perak River, and the Sēmang the right bank, and the two races are very antagonistic. In making constant inquiries about the races of the country, one hears of other races from the natives and also from other sources. Thus M. De Morgan, during his late journey in the interior and amongst the high mountains, I understand, found a race of men much taller and finer than the average Sakai, and also heard of a wild man who was caught by the Sakais, and was said to be almost a dwarf, and covered with a quantity of reddish hair. How much reliance he places on the evidence he received will doubtless appear in his journals, as also whether he considered the larger race of men to be Sakais or not.

Some six months ago I was told by a Sakai chief in Kintah that there was a race who did not know anything about iron, but who used stone axes to cut down trees. Being anxious to find this people I started on the journey from which I have just returned, having failed to find or even gain any authentic information about such people. This was, I believe, also the result of De Morgan's inquiries, who of course was able to penetrate much further than

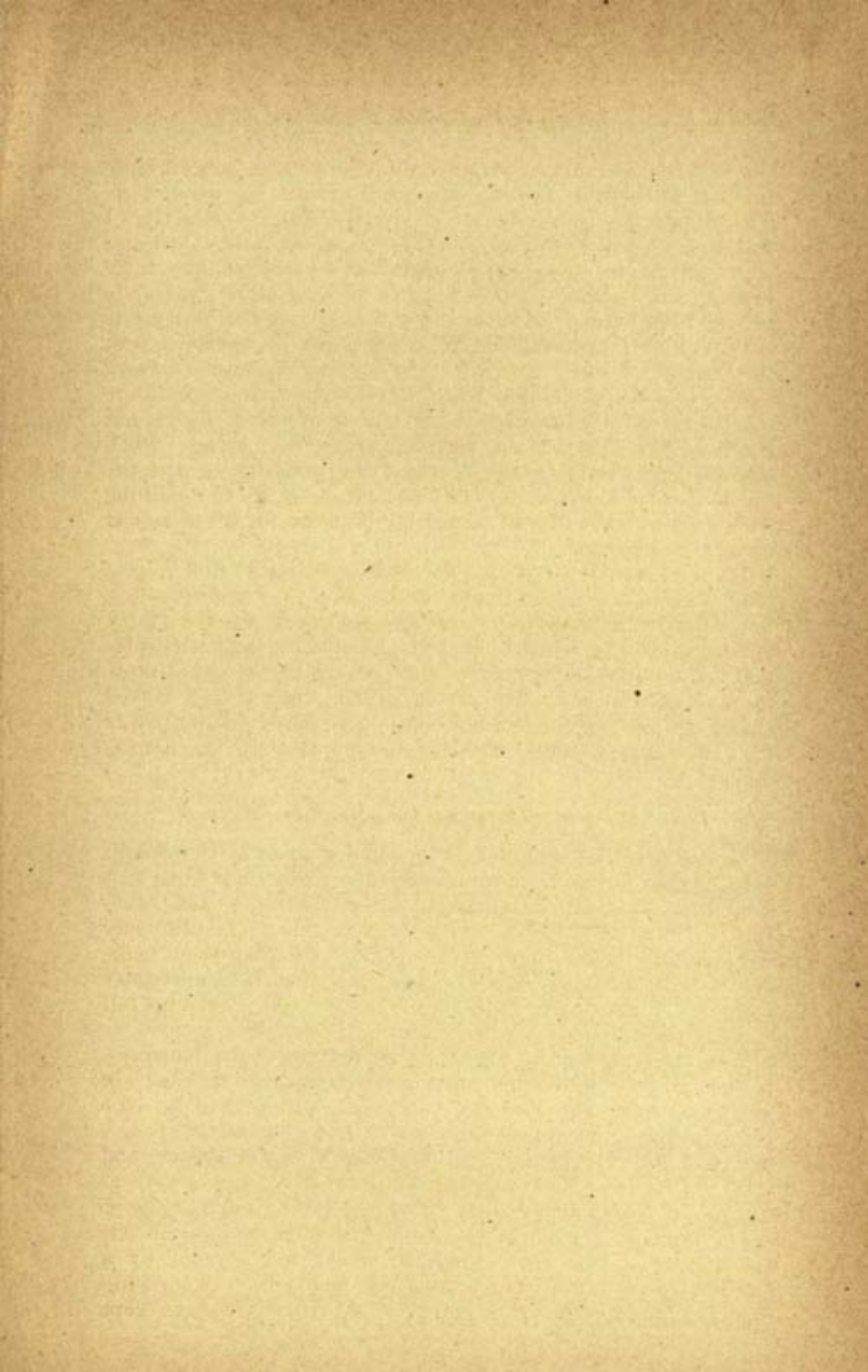
the necklace accepting a sarong, value thirty cents, besides more beads than she had asked for in return for the article in question. The Malays themselves cheat the Sakais most remorselessly. I was told by one of my men that he could always get tin ores sufficient to smelt ten catties of tin for a parong, value thirty cents. I know at the present time several Malays who are getting a great deal of money in this way, but the Malays do not like doing the work much, as they have to live amongst the Sakais for some time, when they invariably catch some of the very disagreeable skin diseases with which the Sakais are almost universally infected, and which are of course the natural result of the fact that the Sakais hardly ever bathe. Such diseases are *Kurap* (scurf), *Kurap hyam* (ringworm), and the much-dreaded *Kudis*, a very bad form of itch. A European living among them must also of course be prepared for these almost certain consequences.

It must be understood that the Sakais whom I visited have long been in communication with the Malays, who live only a few days' journey away, and can most of them talk the Malay language; besides which they have procured a great deal of property from the Malays, such as wood-cutting tools, sarongs, cooking utensils, &c. The whole of the time that I stayed amongst them I was never more than four days' journey away from Kending, which is the last Malay place up the Kintah Valley.

Weapons, Traps for Animals, Fish, &c.

* *Sumpitan*.—The sumpitan is the chief weapon of the Sakais—in fact, so far as I am aware, the only really native one that they use; they purchase spears, krisses, parongs, and other things from the Malays, but I believe this to be the only weapon they make themselves. I am told that they make spears with hardened bamboo blades with which to encounter animals. I have seen these spears, but the Sakais always tell me that they are only used to set up in the jungle as traps.

As so many erroneous ideas are current about the blowpipe, perhaps it will bear once more being described. I have six sumpitans, purchased at different times from Sakais; the respective lengths are as follows:—7 feet 7 inches, 7 feet 5 inches, 7 feet 2 inches, 6 feet 9 inches, 6 feet 4 inches, and 6 feet 1½ inches. The sumpitan consists of a straight tube of bamboo, of either one or two joints (those with only one joint are very rare); if made of two joints, the joint itself is cut out and the two pieces most carefully joined and secured by a flange: this is fitted with a wooden mouthpiece, something like the mouthpiece of a cornet. The tube is always kept



myself, starting as he did with a properly equipped expedition party.

I am told that M. De Morgan found two stone axes in the houses of Sakais; but that these were not in use, having been found either on the ground or below the surface by the present owners, and preserved as curiosities or relics by them. I also found a very beautifully shaped little axe in the house of the head chief of the Ulu Kintah Sakais, which the owner told me he discovered in his tin mine. He had no especial reverence for it, only using it occasionally to sharpen his knife on, and not having the least idea what it was, he was very glad to exchange it for a parong (chopping knife). I made very strict inquiries as to the circumstances of its discovery, and learned that it was found in a small hill worked for tin by the man who gave it to me. It was in a bed of sand containing some timber and a few sub-angular pieces of quartz and other small stones, 3 feet under the surface, and rather less above the bed of drift containing the tin ores. I found also by inquiry that there was some clay above the sand and below the made earth; consequently I conjecture that the specimen was lying on the top of the sand drift bed, as it shows scarcely any signs of water wear, being almost as perfect as when first ground out of the pebble picked out of the river, except that it shows the mark where the Sakai had for a long time sharpened his knife on it (Plate XI, fig. 1). If there are any tribes still living in the stone age they must be looked for still further up country.

The Sakais are essentially landmen; living up here as they do in the mountains, and near the sources of the rivers where it is quite impossible to navigate them, they know nothing about boat-building, not even to the extent of making a bamboo raft. In this the Sémangs are their masters, as they do make rafts, of about twenty or thirty large bamboos on which they float down the Perak River nearly to Kwāla Kangsar; but even they walk back again.

During the past year I have seen a great deal of the Sakai people, and have always found them, where not demoralised by Malay intercourse, most kind and simple-hearted, always anxious to do their best to assist any white man that happens to be in want of assistance, and I find that the opinion of other people out here who have had dealings with them coincides with mine in this respect. I had to experience an example of their untrustworthiness when I started on a journey the other day, but that was from the hands of a chief who lived close to the Perak River, and who was more like a Malay in character than a Sakai. He was in fact an opium-smoker, so that my promise to supply him with opium and rice if he would guide me up into

the mountains was quite sufficient to induce him to deceive me most wofully. He took me only as far as a Sakai village one day's journey beyond Goping, where lived some of his relations whom he wished to see, and found my rice handy to help him on his journey. After he had had his talk with his friends he quietly informed me that he did not know of any other Sakai villages farther up country, and then he and his men left me and my baggage to get on in the best way that we could. I stayed two nights at this village trying to get the Sakais to take me on, but they held to the other chief's statement that there were no more wild tribes that they knew of in that direction; and besides which the river Kampūr was impassable, so that I had to retrace my steps to Goping, with the disagreeable feeling of having lost a week of, to me, very precious time. The Sakais at this place also were much too civilised to answer my purposes. I did, however, succeed in getting a few specimens of hair, and also learning a few Sakai words.

Near Goping I was lucky enough to find a gentleman, M. Ardouin, who went through with M. De Morgan. He kindly got me some Malays who had accompanied them on their expedition, and with these I determined to try and get into the mountains from Kending, as I had done once before about six months ago. In this I was fairly successful, and spent a most enjoyable week amongst quite a different class of Sakais than the people who lived nearer the Malay Kampongs. The head chief of the Ulu Kintah Sakais kindly gave me two men to guide me from place to place, and with these and four Mandayhaynugs I went from house to house exchanging my beads, tobacco, common sarongs, and other small articles for their own manufactured things of daily use, and making notes of what I considered most important. Everywhere I was received most hospitably. When I entered a house a bed place for myself and my Malays was immediately prepared in the best situation; water was brought for me to drink; maize or tapioca roots (*ubi chien*) were put into the ashes to roast; everybody belonging to the house was called in from the jungle to see me and my parcels of beads, &c.; and then after I had had a wash and some food we spent the rest of the day and evening in talking and bartering. Money is as yet almost unknown; in fact, at one house I was most innocently offered a necklace containing amongst other precious things, such as monkeys' teeth, snails' shells, brass rings, monkeys' hair in tufts, and strings of black and white seeds, nearly \$2.00 in small silver and copper coins, all of which the owner was anxious to exchange for one string of glass beads, value ten cents, and a small tobacco box with a mirror on the lid, value four cents more. My 'cute Malays were quite disgusted when I insisted on the owner of



Fig. 1

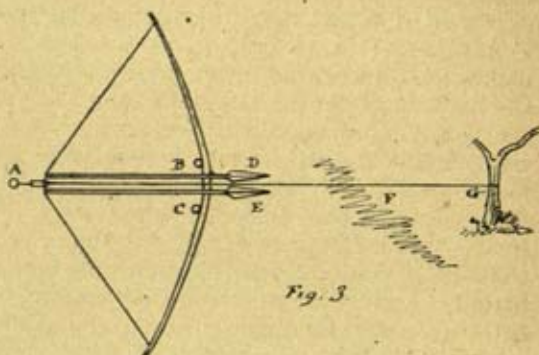


Fig. 3



Fig. 2.

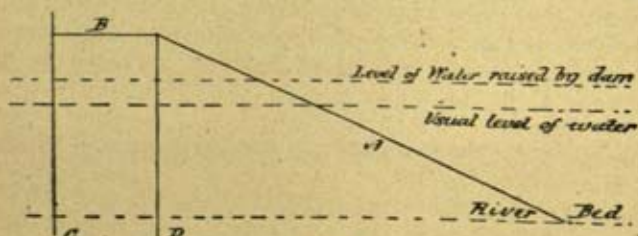
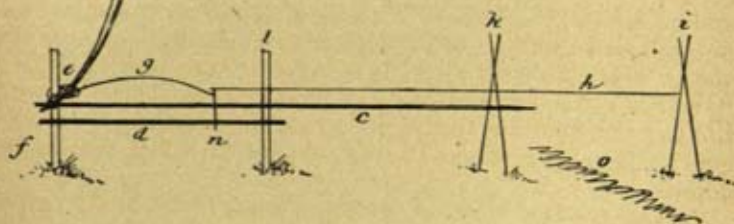


Fig. 4.

inside another tube of bamboo to preserve it from damage, as it is very thin and delicate; the bore of the tube varies from 9 millimetres to 15 mm. The darts are from 8 inches to 11 inches long, and about 1 mm. in diameter; they are made from the hard midrib of the Bërettam palm leaf; one end is carefully sharpened and dressed with poison, the other is provided with a small hub of the pith of the same palm, so that it has plenty of room in the tube. The poison most generally used is the sap of the Ipoh tree; this is boiled down to the consistency of thick treacle in a large quantity; it will then keep for any length of time in a properly corked bamboo; when required for use, a little is put on a large spatula and warmed over the fire with a little water and then put on to the end of the dart. To use the sumpitan it is also necessary to have a supply of some soft material, like raw cotton, to use as a wad behind the dart to prevent the escape of wind when blowing the dart out of the tube. The Sakais use for this purpose the velvety covering found at the base of the midribs of the leaves of some rattans: this product is also used as tinder to catch the sparks from the flint and steel.

The sumpitan is a very deadly weapon for any animal up to the size of a siamang, and up to the distance of sixty yards. A Sakai clever in the use of it will put five darts out of six into a common playing card at fifty yards distance. The sheaths which contain the darts are generally very nicely ornamented; they are supported round the waist by a cord of native manufacture, and fastened by a bone of a monkey, the upper mandible of a hornbill, or something of that description; at the bottom of the sheath is always kept a supply of beeswax with which to polish it, and also the outer case of the sumpitan; this, together with the fact that they are always hung over the fire where the smoke gets at them gives them the rich red colour which the Sakais admire.

Belantay.—The belantay, or spear-trap, is used of a great many sizes, for game as large as the rhinoceros down to animals of the size of the porcupine. When used for large game the spear is either made entirely of bamboo, hardened by being hung over the fire for a long time, or the blade only is bamboo, securely fastened to a stick of strong wood; for small animals a simple stick of hard wood only is used, the point of which has been hardened in the fire.

This belantay is shown set in fig. 2, Plate XI.

(a) A very strong bender held between two trees at (b).

(c) The spear which is securely fastened to the end of the bender (a).

(f) and (l) Two strong stumps stuck in the ground.

(d) A strong straight piece of wood fastened to the two stumps.

(k) and (i) Two pairs of sticks (k) serve as a support for the point of the spear, and to (i) is attached a fine string (h) of rattan or otherwise, which is stretched across (o) the track of the animal.

(e) A strong loop of bamboo fastened to the stumps (f).

The trap is set by the large bender being drawn back to the stump (f). The loop of bamboo is then taken across its end above it, the small bender (g) is then passed through the loop, the other end of the small bender is then held down by a (n) ring of rattan, which plays along the pole (d); to this ring is fastened the string (h). An animal passing along the path (o) strikes the string (h), which pulls away the ring (n), thus releasing the small bender (g), which flies away, releasing the strong bender (a), which springs back to its natural place as far as the stump (l), carrying with it the spear (c) with all the force available according to the strength of the bender, and of course spearing any animal that is passing along the path.

This belantay does not release the spear which is fastened to the end of the bender; by a slight modification, however, in which the bender is so arranged as to strike the butt end of the spear, it is by some Sakai tribes made to fly like an arrow across the track of the passing animal.

Whilst I was making my inquiries concerning this trap at the house of a Sakai chief, who had ordered one to be set up for my inspection, one of my Malays, a Perak man, said that he knew how to make a belantay of another description, which he accordingly did. This belantay (concerning which the Sakais declared utter ignorance) is shown in fig. 3, Plate XI; it is a bow of properly elastic wood, about 14 feet long, drawn by a rattan string. *A B C* are three strong posts to which it was fastened. *D E* are two lembings (Malay spears), one or two may be used. *F* is a string stretched across the track of the animal, which releases the bowstring by a similar arrangement as in fig. 2, Plate XI. This bow is set about 15 feet away from the path, and the spears are discharged like arrows.

Neither the Malays nor Orang Sakai use the bow and arrow as a weapon, but the Orang Sémang use a very fine bow, 7 feet high, with highly finished arrows, which are armed with iron points of good workmanship, and poisoned.

Springs.—The Sakais use springs made of rattans, and of course set in several ways as circumstances require; but the most usual thing is a simple loop of rattan drawn tight by a strong bender: with these they catch rats, squirrels, and animals as large as the porcupine.

Birdlime.—The sap of a gutta tree is sufficiently boiled to make it very adhesive, quantities of thin slips of rattan are doctored with it, and then planted over the ground which is frequented by any species of bird small enough; and of some gregarious sorts, like the little paddy bird, quantities are taken.

Fishing.—They do not appear to know anything of angling. But they make very beautiful casting nets (Jalal), making the string themselves of the inner bark of a creeper, by twisting two strands together on the thigh in the usual way. At present these jalals are weighted with tin in the same way as the Malays, the tin rings being bought of them.

I also saw an extensive fish trap in the Kintah River, where it was about sixty yards wide and rather swift.

The section of this trap is shown in fig. 4, Plate XI. *A* is a grating of bamboo. *B* a platform to catch the fish. *C* and *D* two rows of strong posts. This grating is built halfway across the river, and being strongly made will last a year. During flood times many fish are taken, but more during the driest season, when the other half of the river is dammed, and all the water made to go through the grating. To assist this process a certain poisonous jungle root is thrown into the river above the grating some distance, which drives the fish down half stupified; often several hundreds of fish are taken by this means, and of large size. The Sakais live on the mountain tops and do not go down to the big rivers for fish unless forced to do so by scarcity of food.

Religion, Superstitions, &c.

On first acquaintance with any savage race it is of course very hard to find out anything of their religion. The following facts must therefore be taken for what they are worth.

When a person dies they bury him or her, and with the body they also bury some articles of the deceased in daily use, such as his small rattan bag for tobacco, a necklace of beads, tinder box, or, if a woman, her comb, necklace, or bracelets. Invariably the house in which a person dies is burnt down and the place entirely forsaken, even at the possible loss of a coming crop of tapioca or sugar-cane.

A man goes to a considerable distance for a wife, generally to a tribe who speak quite a different dialect. He gives the parents presents of considerable value, such as sarongs, or bill hooks (parongs) purchased from Malays, or he may clear one or two acres of jungle and plant it with tapioca, sugar-cane, &c., and present to them.

They have a certain amount of veneration for objects which belonged to deceased friends and relations. Thus I tried to

exchange some beads for a necklace which was in the possession of an old woman, but she would not part with it, alleging as a reason that it belonged to a friend who had been dead for a very long time.

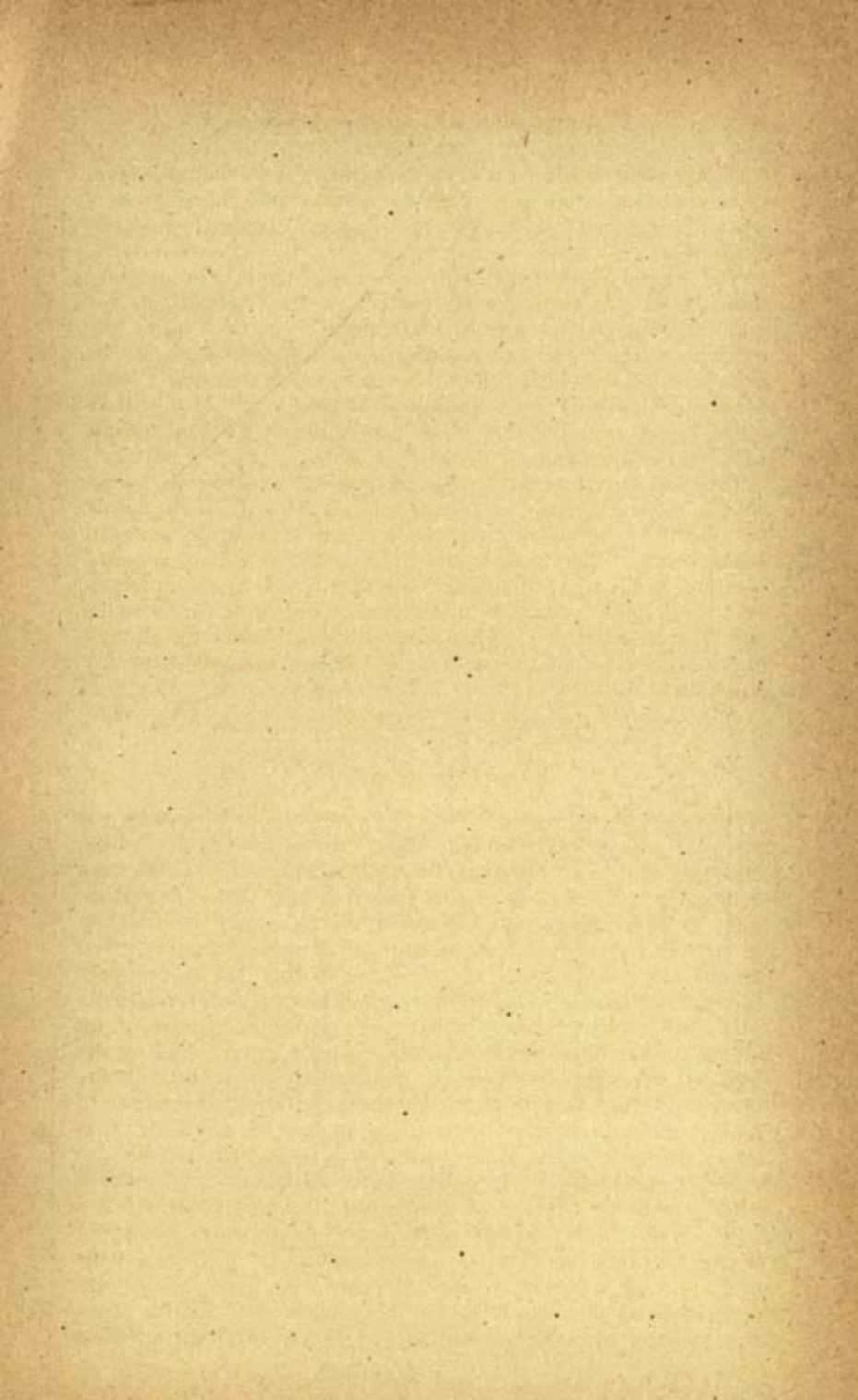
The drum which belongs to the whole house also is very difficult to purchase; at several places they refused to let me have one at any price. Ultimately I secured one at the extravagant price of one cooking saucepan, two parongs, one cherenim (tobacco box) full of tobacco to every man, and a brass Malay hair-pin to every woman in the house, a cost of more than \$2.00, the reason alleged in every case being that the old people of the tribe liked to hear it in the evenings.

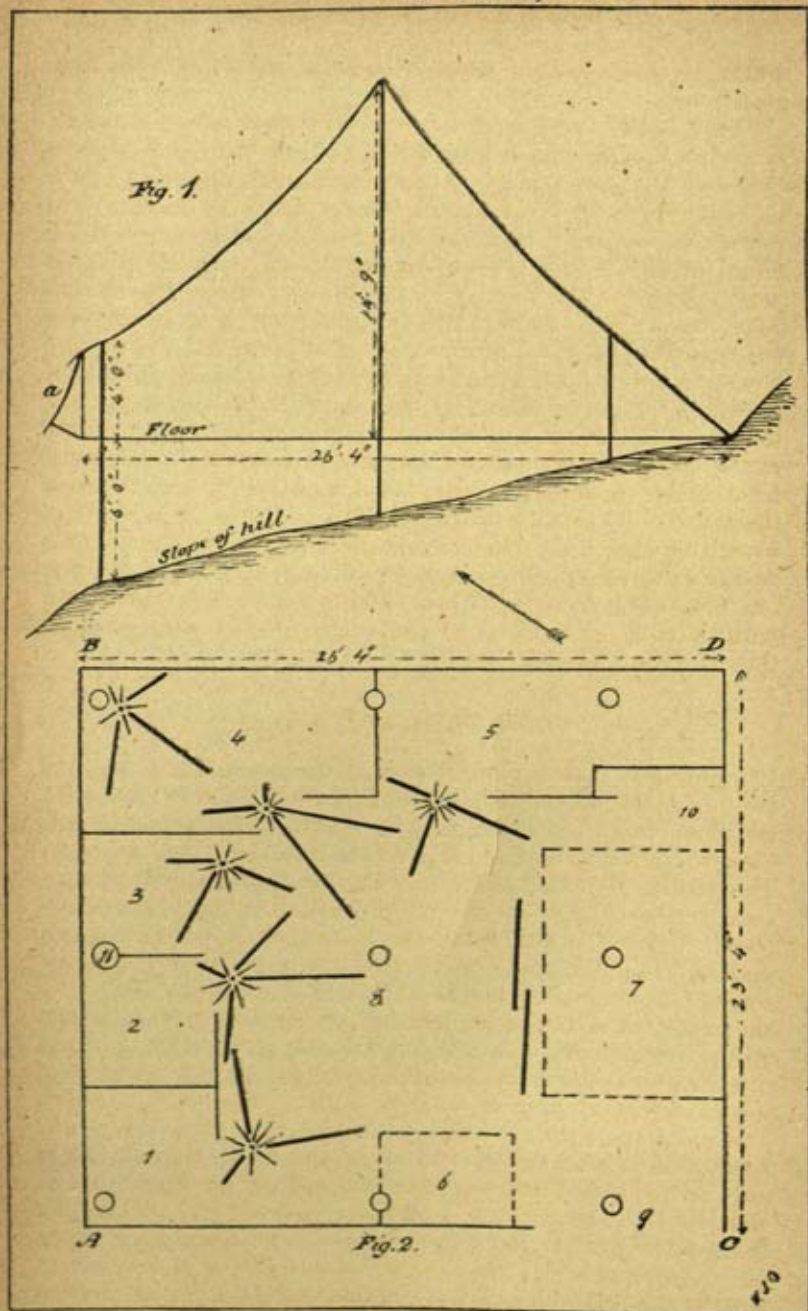
One whisker of a tiger (a single bristle) was offered to me for the rather high rate of twelve parongs (\$6.00). I ultimately secured it for one parong, because it was in a nicely ornamented bamboo case. Tiger's teeth were valued only at about five cents' worth of beads, but the whiskers are of very great value to insert into the handles of any weapons, as they are supposed to make the wearer invincible. This superstition is shared by Malays, and here in Kwāla Kangsar I have been offered \$4.00 for my single bristle.

For description of the fruit festival see Appendix, page 299.

Dress, Ornaments, &c.

The primitive dress of the Sakais is kain traap (bark cloth); a strip of this is twisted round the waist and drawn between the legs, and the Sakai man or woman is dressed so far as actual clothes are concerned. Even those Sakais who live near Malays, and are able to buy sarongs and Chinese trousers, always when they go into the jungle return to their old dress, though very often an old rag is substituted for the bark cloth. The men appear to wear no ornaments except very small bracelets and waistbelts made of a black leafless aquatic creeper, found growing on stones under water in the mountain streams, and called by the Malays, who are also fond of wearing it, *arca battu* (stone creeper). The women wear bracelets and necklaces made of seeds, shells, certain sweet-smelling roots, and anything that they can get from the Malays which can be strung on. I have a necklace which I purchased from an old woman; it contains nine strings of black and white seeds differently arranged, a string of old Malay copper coins, a few glass beads, one tip of a squirrel's tail, two tufts of monkey's hair, a serpent ring made of brass, that is to say, a spiral of brass wire, five snails' shells, and the brass support of the ribs of an umbrella. This is about the average of a Sakai necklace, and one of their greatest





SECTION AND PLAN OF A SAKAI HOUSE.

ambitions seems to be to replace the black and white seeds with glass beads.

Through the septum of the nose they wear either a porcupine's quill or a long bone of a fish or bird or monkey. They also wear the same things in their ears; there appears to be a tendency to make the holes in the ears large. I observed two women wearing rolls of cloth as large as my little finger, and I found great difficulty in abstracting one of these, as it fitted very tightly. Except close to the Malay villages, the Malay women wear their hair in true negrito style, that is, standing out from their head all round in a great mop; but where they have any intercourse with Malays, they tie it back in a knot like the Malays. Indoors, if they have it, they always wear the Malay sarong, and in one house, from an excess of modesty rather rare amongst savages, the women would not dance until I had given them each a strip of common cotton stuff to cover the breast. They wear quantities of brass wire bracelets, and when they dance, a sort of high turban made of bark cloth, or a wreath of sweet-smelling grasses and leaves. The women also ornament their faces and their breasts with red figures, traced with the juice of the fruit of the anatto (*Bixa orellana*), which they cultivate for that purpose.

Houses, Habits of Living, &c.

I annex a sketch plan of a Sakai house, in which I stayed two nights. I proceed to describe it (see figs. 1 and 2, Plate XII). As shown in the elevation, fig. 1, it is built on the slope of a hill, close to the top (I guessed this hill to be about 3,500 feet high). The roof is thatched with the common Brettam attaps in the same way as Malay houses, except that it is much more carelessly done. The whole house is supported on nine posts, marked *O* on the plan, fig. 2; these posts are very slight, and some of them crooked, but as additional support one of them is the trunk of a large tree cut off to the proper height, and stripped of its bark to kill it (marked 11, fig. 2). Except these nine timbers, the house, rafters, uprights of the walls, floor joists, and everything is entirely built of bamboo for timber. The walls are covered with attaps tied into great sheets, and hanging only from under the eaves and from the same height on the end walls, these sheets are opened outwards in fine weather like shutters, as at *a*, Plate XII, fig. 1, thus making the house very comfortable and airy. The house which I am describing, and which may be considered a typical one, except that the Sakais are very adaptable to circumstances, using bamboo or sticks for timber, bark or leaves for the walls, &c.,

was situated close to the top of the hill, more than one hour's hard climb above the nearest water. It was surrounded by a felled space of about two acres, where the inhabitants cultivated their tapioca, maize, sugar-cane, and tobacco. The house contained, without my party, sixteen inhabitants, disposed as follows (Plate XII, fig. 2):—Division 1. An old man and his wife equally old; 2. Their son, aged about nineteen, and his wife; 3. A middle-aged woman whose husband was absent; 4. A man with two wives and two children, one by each wife, one child being about six years old, the other about two; 5. A man with his wife and two young children; 6. A raised sleeping place for two sons of No. 5, one about thirteen and one fifteen, both bachelors. When I arrived, the raised place, marked 7, was put up for me and three of my Malays to sleep on. Two other Malays took possession of the bed-place No. 6, whose proper tenants slept on the floor amongst the logs at 8, with my two Sakais. At 9 is a door in the end wall, and at 10 another cut in the slope of the roof. The dotted lines show the limits of the raised bed-places at 6 and 7; these are platforms, about 2 feet high, made of bamboo; the Sakais sleep on them without either mat or pillow—I found it quite hard enough with a double mat. The slighter black lines show the limits of each family's quarters; they are divided by very slight partitions of split bamboo, 2 feet high. The inmates sleep on the floor. The thick black lines, converging towards the stars, show the different hearths, each family having its own. It will be observed that two hearths are allotted to the division marked 4. I noticed in three instances where a man had two wives, each woman had her own separate hearth. These hearths are very simple constructions: first a mat of leaves about 3 feet in diameter is laid on the floor, over this is spread about 3 inches of earth, and a fire lighted, which once lighted is not allowed to go out. For although every Sakai carries a tinder-box, it is much easier to blow up a smouldering log into a blaze than to re-kindle it. Three or four long logs of suitable wood, each about 9 inches in diameter, are arranged so that their ends approach on the centre of the hearth, a small fire is lighted in the centre with sticks; the logs keep the fire for weeks, and as they burn away they are gradually drawn into the fire. The burning ends serve as a support for a saucepan, and the accumulated ashes below to roast tapioca and sweet potatoes in. As there are always several other logs lying about the floor, drying ready for use, it is not very easy to get about without knocking one's shins.

As soon as it begins to get light, the Sakai gets up and prepares his breakfast, some roasted tapioca, perhaps with a

stick of sugar-cane; the men and women sit in the doorways of their small places; if the woman has a child, he will probably be employed in disentangling his mother's hair with a comb (figs. 1 and 2, Plate XIII) or bamboo pin (figs. 3 and 4, Plate XIII), and—it is no use denying that these people are very dirty—destroying the animal life there found. In the meantime the fires will be all burning up briskly, for the mornings are very chilly on these hill-tops, and the Sakais sleep in the very scanty attire which they wear all day. After breakfast, some of them shoulder their *aga*, a sort of carrying basket slung on to the back like a knapsack, and with a *parang* or *sumpitan* go off into the jungle after food or firewood, or damma for torches, or whatever may be the necessity of the day. The rest stay at home and work about the house, making *sumpitan* darts, carving bamboo sticks into patterns, which bamboos are destined to hold some of the numerous necessities of savage life, and a bamboo joint which was required for use would seem imperfect unless ornamented. During all this time they always keep something ready to eat. They have, so far as I could make out, only two regular meal times, early morning and midnight; but during the day, if indoors, they are continually eating either sweet potato or tapioca, or sucking sugar-cane. Only once during my journey have I seen animal food in a Sakai house other than that which I introduced myself. This was part of a stag which had been taken with a *belantay* (spring spear), and which had been shared by several houses. In spite of the very deadly weapon with which they are armed—the *sumpitan*—they never search for game until everything else fails.

Those who had gone out in the morning generally return about 3 P.M., heavily laden with jungle produce. From this time up to about 9 P.M., eating, talking, and if there should be a good supply of damma for torches, perhaps singing and dancing, is indulged in for an hour or two. About 9 P.M. everybody turns in, only to wake up again at midnight, at which time the fires are lighted up again, and some more tapioca or sweet potato roasted and eaten, after which they again go to sleep until morning. This midnight supper seems to be an invariable custom; it occurred every night that I slept in Sakai houses.

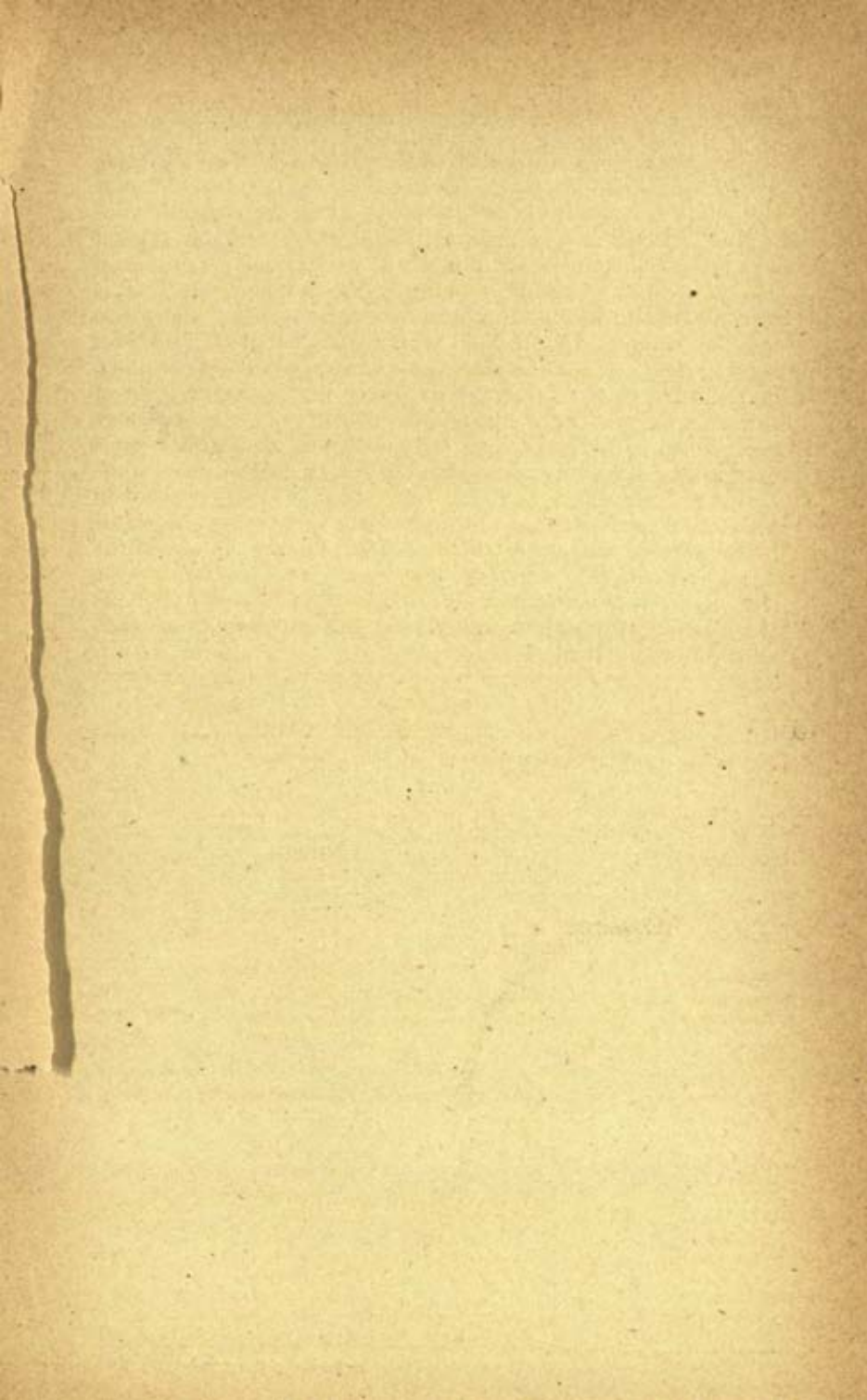
The Sakai Song and Dance.

On two occasions I was enabled to witness a performance of the song and dance by Sakais in their own style, once at the house of which Plate XII, fig. 2, is the ground plan, and once at another similar house.

The performance is commenced by a man who takes the

drum, a very rough instrument made from a section of a tree 2 feet 6 inches long and 1 foot 2 inches in diameter. This is hollowed out by burning and chopping until the circumference is about half an inch in thickness. Across one end the skin of a siamang (gibbon)—or of apparently any animal—is stretched and kept taut by means of rattan cords and wedges. This is the only instrument used in the performance. After about five minutes' beating of the drum to a very monotonous 1.2 time tune, another man gets up and performs a dance, or perhaps two men at the same time: this dance is a very simple performance of certain gesticulations, the principal of which is a sort of courtesy made once to every 1.2 beat of the drum; at the same time grotesque gestures are made with the hands. After about half-an-hour of this description of dancing, the men all squat about in convenient places on the logs, and commence to sing or chant in the same monotonous 1.2 time. The following is one of the dobokh, or songs. I wrote this down as it was sung, and got the more correct pronunciation afterwards; this is easily done, as one man chants a line, or rather word, first by himself, and then all the rest sing it in chorus:—

Sakai.	Malay.	English.
Jerlemoi	Gunong	Mountain.
Jerreboo	Bukit	Hill.
Tra-ap	Turong	To descend.
Cherook	Jalan	Road.
Al our	Ayer kechil	Stream.
Moug-alas	Chaukat	Hillock.
Yung-bēlah	Gunong	Riam.
Gass-ahr	Ditto	Ungus.
Yer-rail	Ditto	Chabbong.
Mah-wah	Ditto	In Ulu Burong.
Youg-yup	Ditto	Ditto.
Guss-aal	Ditto	In Ulu Kerlon.
Chen-goat	Ditto	In Ulu Burong.
Laut-urrah	Ditto	Two months' journey from Kintah.
Jel-li	—	—
Yeu-yeel	—	—
Ber-rok	Ditto	Sungei Pērrang.
Lan-noh	Ditto	Ulu Sungei Riah.
Bērrap-pit	Ditto	Ditto.
Ed-joah	Ditto	Ditto Kintah.
Jah-goo	Ditto	Ditto.
Bē-nah	Ditto	Near Tambou.
Ba-kāh	Ditto	Kintah.
Tad-dah	—	Ditto.
Cheb-bēarih	—	Ditto.
Tam-boon	—	Tambou.
Bēt-eham	—	Name of a Malsy village.
Chab-bārh	—	River Chōh.



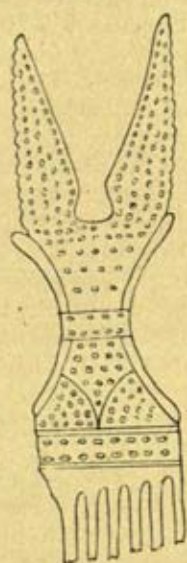


Fig. 1



Fig. 2

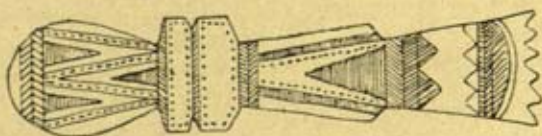


Fig. 3

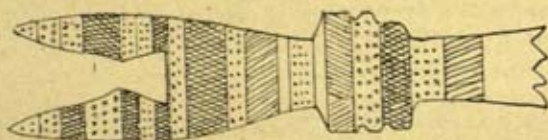


Fig. 4

The song is closed by a long-drawn shout or cry something like "Heugh." From this it would appear that the Sakais' song is nothing more or less than a repetition of the names of a number of mountains, rivers, &c. This, in fact, is all that I could make of it, except that the names were said most emphatically to be those in the Sakai country. This has some little significance, as all these places are between the latitudes of $4^{\circ} 30'$ and 5° , and all in the Kintah watershed excepting the mountain called Laut-urrah, which was said to be two months' journey away, but this may be very fairly considered as a little indefinite. From the evidence of the song I should consider that it described a country of not very large limits, some of the places being still occupied by Sakais and some having been so originally; amongst the latter being Tambou, now a Malay village with cocoanut palms at least twenty years old, and consequently having been in the possession of Malays for that time, as Sakais do not plant cocoanuts.

After these songs have been sung for perhaps an hour, the women come forward and commence to perform; it can scarcely be called a dance, as they do not move from place to place, only go through certain evolutions as they stand. First they clap their hands in time to the drum for a few bars, at the same time repeating the syllables Sough! sough! sough! and then Chaep! chaep! chaep!¹ perhaps six or eight times, each at the same time curtsying once to every beat of time rather low; then the arms are dropped to the sides, and the body is turned from side to side from the hips, and the arms allowed to swing round loosely with it, once to every beat of time; at the same time a deep curtsy is made as before: this is repeated about six times. It has a very pretty effect, as it is done by a graceful swaying movement. After this they stand still, with the exception of a very slight curtsy to every beat of time, at the same time one arm is placed akimbo, and the other held out with the hand loosely open, and in time to the drum the forearm is turned so as to present the hand with the palm alternately upwards and downwards with a very slight, at the same time graceful, movement: this is continued until the end of the song, when the whole process is repeated.

I could not discover that there was anything else in connection with the string of names. It may be that it describes some journey, or other incident, as the few introductory words would seem to intimate, but I could not make out anything to that effect.

Besides the drum they have a long bamboo flute with three

¹ These words are equal to "Yes! Yes! Go on! Go on!"—*i.e.*, encouraging cries.

holes, a sort of whistle also of bamboo, a Jew's harp also of bamboo, and a guitar with three strings made of fine rattans stretched on a large joint of bamboo. This last I have not seen in the Kintah district, only near the Perak River. None of these instruments, however, are used to accompany the dance or song.

Food.

The Sakais in a wild state eat everything in the way of animal food that they can get. Even snakes and lizards are not refused. But they do not appear to bestir themselves in the search of it until vegetable food is on the point of exhaustion.

The same applies to their fishing. Once in about three months a large party of them will make a journey of perhaps a week to a suitable place on one of the big rivers, and then by means of dams, &c., they will secure a large supply of fish and have a great feast; they do not understand drying it, consequently it only means a few days' feasting, whilst the fish lasts good.

The Sakais nearer the Malays cultivate tapioca, sugar-cane, and sweet potatoes. But M. De Morgan, I believe, found a tribe who cultivated only millet.

I discovered two manufactured foods. One was made from the tubers of a wild tapioca; these roots, if eaten in their natural state, are said to cause a sort of drunkenness (*maboo*) or perhaps sleepiness. The Sakais sink them to about 4 feet deep in the mud of a swamp; after they have lain there four nights they are lifted and brought home, and the women set to work to rasp the now soft roots up into a pulp, using a prickly rattan for a rasp. At this time they have a particularly sour and pungent smell, which I can only describe as a mixture of very sour milk and rotten eggs. The pulp is then put into a mat and the juice most carefully squeezed out. This is done by a simple lever, one end of a long piece of timber being put under the plate of the house, the bag of pulp placed under the lever, and a woman sitting on the other end soon expresses all the water. The dried pulp is then squeezed into a joint of bamboo and dried over the fire; it will then keep for a month. It is then quite a good food, though, of course, it has a very pungent sour smell. This food is called by the Sakais, *koyee*.

Another sort of seasoning, or sambal, as the Malays call it, is made from the seeds of a tree, called by Malays and Sakais also *Präh*, and hence the name of the food is *Serüm präh*—*Serüm* being the word used to express anything squeezed into a joint of bamboo. These seeds are sunk into a swamp for between three and four months, carefully enclosed in a sumpet (mat bag), to which a lifting string has been secured. They are then lifted

and pounded into a bamboo. The sambal will then keep for a great time; it is very good, having a taste between toasted cheese and fried ham. But of course the odour is very pungent; as, however, this is the case with so many of the Malay foods which one constantly eats, it is unnoticeable.¹

APPENDIX.

Description of a Sakai Fruit Festival.

[Added after the Paper had been read.]

A few days ago I was invited by a Sakai chief—whose tribe, consisting of about sixty men with their families, inhabit some hill-tops about 1,000 feet above the level of the Kintah River at a place marked Tanjang Keukong on the maps—to his annual “Cheuteh,” or fruit festival, which he had so arranged as to answer the purpose of a “house-warming,” in respect of a new house which he had just built. I must premise for the better understanding of my description that this chief, and, in fact, all of the different tribes of Sakais that live near the Malay Kampong, are able to speak Malay more or less fluently, as they are in the habit of trading with the Malays for cloth, tobacco, rice, parrangs, beads, &c., for which they give in exchange tin, sand, or their own labour in felling jungle for the Malays; in these bargains the Malays cheat them most unmercifully. The Malay chiefs have also for a long time exercised a little authority over those Sakais that live within their reach, nominating their chiefs and giving them titles answering to the titles of their own chiefs in the times of the Rajas.

I was accompanied on this journey by another officer of this service, and by several of our Malay chiefs. After riding as far as the roads permitted, we went on for a good day's journey on elephants, arriving at the Sakai chief's ledang late in the afternoon. We found that the chief had got all his tribe together, and had furthermore some invited guests from the other side of the main range, that is, from Kelantan. These Kelantan Sakais were much finer-looking men, and had evidently not been spoilt by too much intercourse with Malays, as they were dressed only in their native dress, consisting of a long strip of bark cloth twisted round their loins and passed between the legs. As the Sakai chief had been awaiting my arrival for several days, which was more or less uncertain, he had not prepared his feast, and

¹ Mr. Hale's paper is accompanied by a vocabulary of about two hundred words and phrases, in manuscript, which is preserved in the Library of the Anthropological Institute.

we had to wait until the next night for the festivities. During the next day the men went off into the jungle and collected wild fruits: these were presented to us and our Malay friends, and the whole day was passed in eating jungle fruit and cooking a bag of rice that I had brought with me for the Sakais in preparation for the feast in the evening; we also procured a goodly stock of bark cloth, ornaments, and other articles, some of which are particularly interesting, in exchange for Malay sarangs, knives, &c., of which we had taken care to provide ourselves with a stock, much to the disgust of the Malays, who considered that we bartered our ware at a much too low rate of exchange.

Rice and tobacco and some materials we supplied them with as our share to the banquet.

About 5 P.M. a large portion of the bare bamboo floor of the house was covered with banana leaves and the boiled rice heaped about on it at convenient distances; then, after the chief had prayed for some time over a cocoanut shell filled with live coals, on which was constantly placed pieces of aromatic gum and wood of different descriptions, the whole party fell to work at the rice, which very soon disappeared down their throats. After this, dancing, accompanied by singing and the music of a drum, an old paraffin tin and some bamboos struck on the floor of the house, was continued until daylight next morning. From the very primitive instruments of music used it might be thought that discordant noises would have resulted. This was, however, not the case; the empty oil can was suspended from the roof, but only very gently touched with the hand. My friend who accompanied me and I both considered that the effect was perfectly harmonious; the music of the Sakais is, in fact, very pretty, much more so than Malay music as a rule.

I took the opportunity to question the chief concerning his prayer, which he delivered in a queer mixture of Malay and Sakai, preceding each string of petitions by the expression "Sumbat," which he pronounced after having blown the fumes of his censer from his hand, most probably to the four winds, as he faced to four different points of the compass, pronouncing the word and blowing the fumes to each; he told me that the word "Sumbat" meant the same as *Salamat* means in Malay, i.e., either "Hail" or "Peace be unto you." I asked him to whom he prayed; he said to the *Hautues*. Now *Hautu* in Malay may be taken to mean either "Ghost" or "Spirit" only—not God; the Spirit may also be either benignant or malignant. I then asked him to tell me what *Hautu*, and he said the *Hautues* of the forest, of the mountains, of the rivers, of the winds, also the *Hautues* of Malay and Sakai chiefs who had died, also the

Hautues of headache, of stomach-ache, the Hautues that caused his people to gamble, to smoke opium, and who sent all sorts of disputes and who sent mosquitoes. He prayed to these Hautues to be kind to him and to his people—to send plenty of food to eat, and not to send any evil things. He further said that Sakais do not pray to "Allah," that is, to God. The question undecided in my mind, as yet, is whether this worship was learnt from the Sakais by the Malay Pawangs of the present day who practise it, or *vice versa*.

Explanation of Plates XI to XIII.

PLATE XI.

- Fig. 1. Stone axe, of hard clay slate, found near Timiong, about two days' journey north-east of Kending Kintah.
 „ 2. Sakai *belantay*, or spear-trap for large game, as used in Ulu Kintah.
 „ 3. *Belantay* of the Perak and Kintah Malays.
 „ 4. Section of a Sakai fish-trap on the Kintah River.

PLATE XII.

- Fig. 1. Section of a Sakai house at Gunong Goumpi, north-east of Kending Kintah.
 „ 2. Plan of a Sakai house at the top of Gunong Goumpi.

PLATE XIII.

- Figs. 1 and 2. Ornamental wooden hair-combs, used by the Sakais in the mountains north of Kending Kintah.
 „ 3 and 4. Ornamented bamboo pins for disentangling the hair, used by the Sakais north of Kending Kintah.

ETHNOLOGICAL NOTES on the ASTRONOMICAL CUSTOMS and RELIGIOUS IDEAS of the CHOKITAPIA or BLACKFEET INDIANS. CANADA. By JEAN L'HEUREUX, M.A., Interpreter.

[WITH PLATE XIV.]

SABIANISM has been the primitive mode of worship of the Chokitapia. They know and observe the Pleiades, and regulate their most important feast by those stars. About the first and the last days of the occultation of the Pleiades there is a sacred feast amongst the Blackfeet. The mode of observance is national, the whole of the tribe turning out for the celebration of its rites, which include two sacred vigils, the solemn blessing and planting

of the seed. It is the opening of the agricultural season. The rites celebrated remind one of the Hebrew Passover, and some of the mysteries held by the Ancients in honour of Ceres.

The Blackfeet call the Pleiades the seven one (*Ekit-si-kuno*), but as the root-word for perfect or perfection is contained in the word, the meaning is "the seven perfect ones."

In all highly religious feasts the calumet, or pipe, is always presented toward the Pleiades, with invocation for life-giving goods. The women swear by the Pleiades as the men do by the sun or the morning star.

The feast of *Innis-si-man* at the disappearance, and the *Mon-toke*, feast of the women at the reappearance, marked amongst the Blackfeet the period of occultation of the Pleiades. *Innis-si-man* means "the grave" or "the burying of the seed"; *Mon-toke*, "the meeting of the absent one." Both feasts are lost in the antiquity of Indian traditional lore.

On the last day of the occultation there is a women festival, called the *Manis-tam*, or flag-pole dance. These rites are very ancient, and of Toltec origin. The women that take part in it are all Vestals of the Sun, and are the same class of women who alone figure in the sacred feasts of the nation. At the feast of *Ocan* they preside over the presents to be distributed to the warriors.

Ocan, from the Aztec word *ocal*, a building, is the feast of building or harvest, or storing in the crop. It is celebrated sometimes in October, and always accompanied by the feast of the dead, which feast is not only tribal, but confined to kindred race. It is called *Sta-pas-can*, "the dance of the dead," and is of Aztec origin. It begins at sunset, and ends at daylight.

In time of scarcity of food, seven vestals of the sun dance alone in a circle, invoking the starry heaven for food for the needy. It is always a nightly dance, and kept up for seven nights' duration.

Emita-stok-sis, "dog-face," is Sirius; *Magsi-satis*, "hunter-belt," the belt of Orion; *Sta-mize-tomo*, "the Bull of the Hills," Hyades. The milky way is called *Makoye-osokoy*, or "the wolf way." The Chokitapia have inherited from their ancestors twenty groups of constellations, which are their zodiacal signs.

The Blackfeet have seven classes of warriors, dividing the stage of initiation to the mysteries into three degrees. All medicine men must be initiated into those three degrees. Their ordeals are mostly connected with number three, seven, or ten. They have passes and signs known only to the initiated. In the incantation of the medicine men many words not belonging to their language are used; some of them appear to me Sanscrit words.

The triangle (*Copan*) is a sacred symbol. It is called the arrowhead of the great hunter, Bull of the Hills (*Orion*). The earrings of the medicine men are made of shell from the Pacific in form of a triangle. (Plate XIV, fig. 1.)

In the religious purification of the medicine men, a hole in the form of a triangle is dug in the ground, seven heated stones are thrown into it, and cold water poured over them for a vapour bath. When thus bathing, invocation is made to the Pleiades, for assistance in curing bodily disease. Seven brass ball buttons are worn by them as a talisman against fever.

The **T**, or tau cross, is a sacred symbol used in the consecration of medicine men. It is painted in blue upon the breast of the newly initiated as a sign of power. It is connected with the gift of healing.

The Blackfeet believe the number three the lucky one, four a bad one, and seven and hundred are perfect numbers.

The sacred dance of the *Ma-tie* class of warriors for the general meeting of all the clans of the nation is supposed to represent the celestial dance of the seven young men personified by the Pleiades above. They are called the Crow, the Partridge, the Eagle, the Owl, the Crane, and the Yellow or Golden Bird, also named *Pokina*, or Chief Bird, who was the leader. They were all brothers, and nightly guard the field of the sacred seed. To keep sleep away in the long hours of night they were dancing around the field. Episors, or the Morning Star, was so pleased with them that he caused them to be transported into heaven, so as to rejoice all the stars by their perpetual dance.

Numerous traces of the Mayal Toltecs' or Nahuas' cosmogony and religious belief are found amongst the Chokitapia. The third Napa, or great prophet of the third age (Natose, or the third Sun of the World), is supposed to be buried in their country in a large pyramidal mound on the Bow River, about seventy miles east of Blackfoot Crossing. It is a graded mound that has not yet been opened. Five years ago a stone tablet with the engraved figure of the sun, with seven arms and hands upon it, was found in the vicinity. (See Plate XIV, fig. 2.)

Close to mounds or tunnels for religious purposes, you will often see the figure of a man with extended arms; from one hand so extended to the other is a circle of loose limestone, passing above the head of the figure. (Plate XIV, fig. 3.)

The legend of Coes-sa in the second sun or age of the world stated that the second Napa replaced all the misplaced members of their bodies, and taught them the way to use them aright.

The Hades of the Chokitapia is said to be situated in the great waters where the sun sets and where is the God, a

mysterious island in the Pacific where there are many sandy hills. They have no Hell, but only Paradise, in their Hades. They all expect to go there after death. *Spatikoy-etapo* is the word used by them to say to a dead person, "He is off for the sandy hills."

The Thunderer is supposed to be an immense bird with green feathers; the lightning he produces with the fire of his eyes, and the thunder by the noise of his wings. His return, on the spring of the year, is celebrated with rejoicing and a sacred dance in his honour. He is supposed to grant to the warriors the gift of invisibility in the fight.

Explanation of Plate XIV.

- Fig. 1. Earrings of shell, worn by the medicine men among the Blackfeet Indians.
 „ 2. Stone Tablet, with engraved figure of the seven-armed sun, found near Bow River.
 „ 3. Figure of man with extended arms, found near an ancient tumulus of the Blackfeet Indians.

On the PRIMARY DIVISIONS and GEOGRAPHICAL DISTRIBUTION of MANKIND. By JAMES DALLAS, F.L.S., Curator of the Albert Memorial Museum, Exeter.

THE number of divisions into which it has been proposed to separate mankind has varied from two to sixteen, and even to sixty, but on geographical as well as upon anthropological grounds it appears to me that not more than three great groups can be satisfactorily maintained. These primary groups I would propose to name and characterise as follows:—

Leucochroi, represented by the European, in which the skull is variable in form, the face orthognathous, eyes blue to grey, with the sclerotic clear and white, the skin fair; the hair varies from yellow to brown, and presents a more or less oval form in section, and the nose is leptorrhine.

Mesochroi, represented by the Mongols and American Indians, in which the skull is also variable in form, the face eurygnathous, the eyes dark to black, the skin yellow-brown to olive, the hair coarse, straight, and black, and presents in section an almost complete circle, and the nose (except in the Eskimo) is mesorrhine.

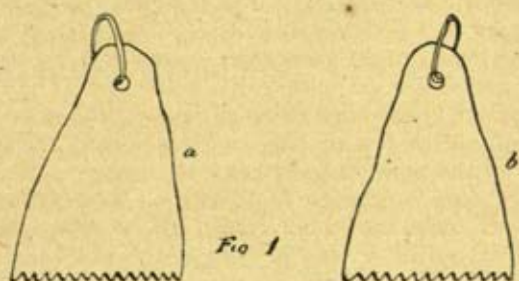


Fig. 1

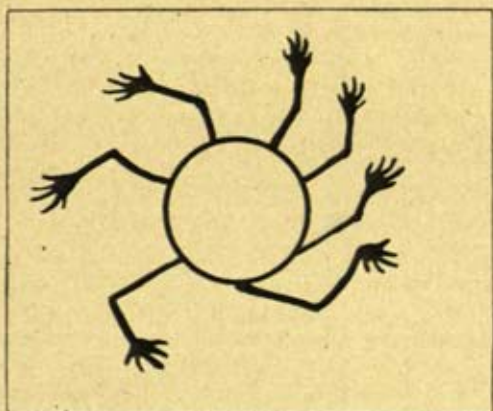


Fig. 2.

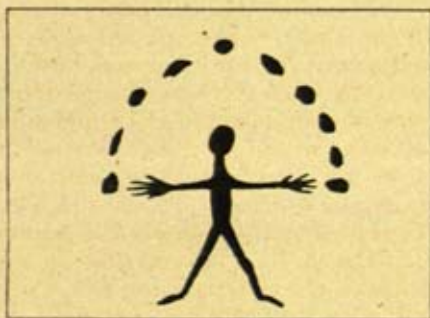
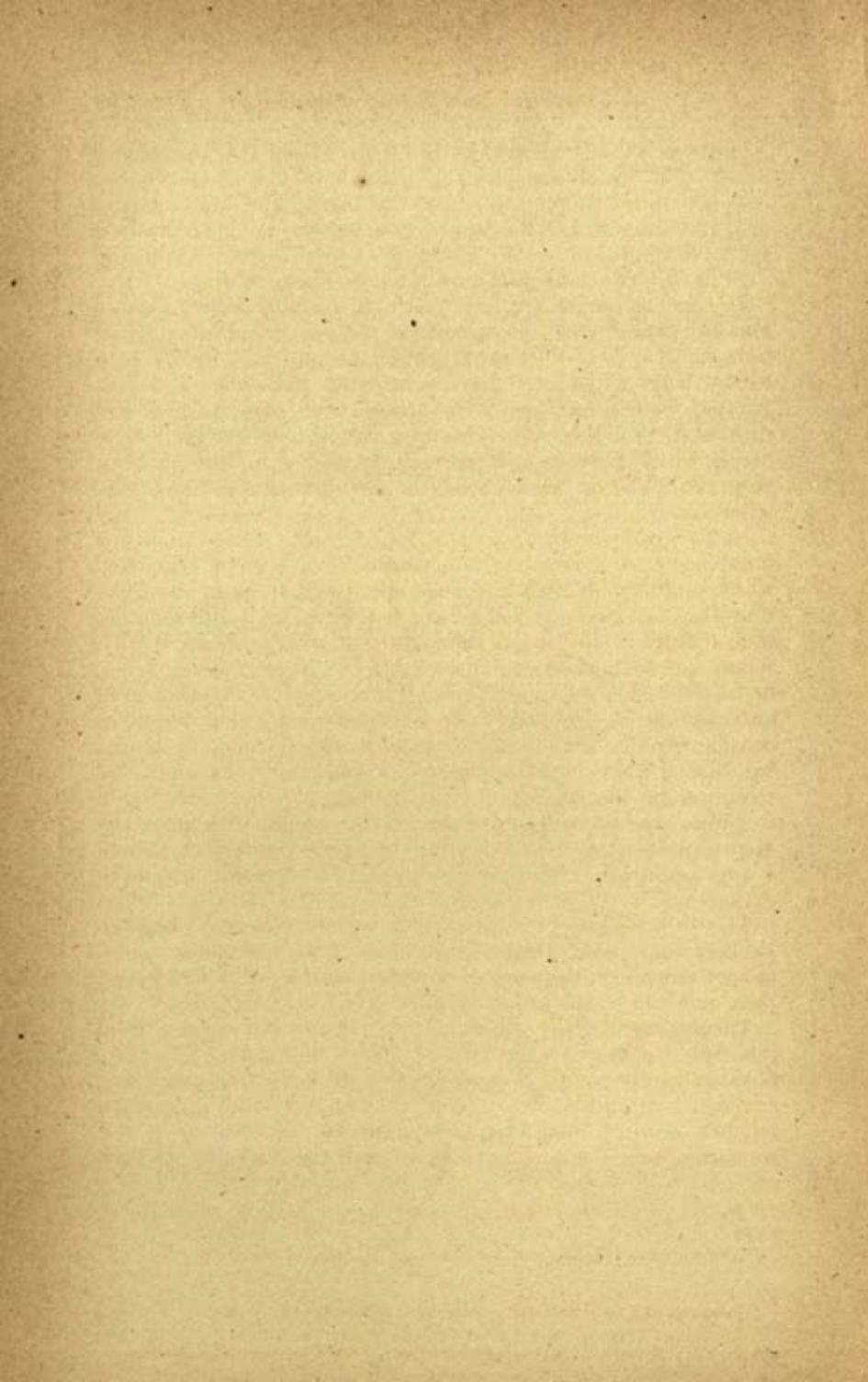


Fig. 3.



Æthochroi, represented by the Negroes and the Australians, in which the skull is dolichocephalic, the face prognathous, the eyes dark to black, and the sclerotic discoloured, the skin yellow-brown to black, the hair black and woolly to wavy, and presenting a flattened ellipse in section, and the nose is platyrrhine.

In this classification I have ventured to differ from Professor Huxley¹ in so far as I have omitted his Australoid group, while from the views of another school of ethnologists² I have been led to dissent, in that I have considered there were sufficient grounds for the retention of a Mesochroic group, more or less equivalent to Professor Huxley's Mongoloid division. The names which I have employed seem to me more desirable than geographical terms, which tend to prejudge the question of distribution.

Æthochroi.³—Anthropologists are, I think, agreed that the inhabitants of Africa, south of the Sahara, present characters which indubitably associate them in one great group, notwithstanding the many varieties which they exhibit in some of their features. But it has been affirmed, sometimes doubtfully, sometimes with great confidence, that the Negro type is not to be traced in North Africa, or at all events only appears in such an insignificant degree as to be scarcely worthy of attention, in considering the distribution of the group. I confess I cannot see that the evidence before us is sufficient to warrant the retention of this view. On the contrary, many points serve to prove the *Æthochroic* origin of the people inhabiting the Mediterranean and Red Sea shores of North-East Africa, though I am far indeed from affirming that this origin is purely *Æthochroic*.

The principal peoples with which we are concerned are the Berbers and the Nubians. At least if we can obtain satisfactory evidence of the origin of these races, it will afford *prima facie* evidence of the origin of allied North African nations.

Though the Berbers differ in many important respects from the true Negro, yet there are points so well marked in their physical aspect, that Prichard⁴ says—"the most interesting fact connected with this race is that they appear, if we may place reliance on historical evidence, to furnish an instance of the transition from the physical character of the Negro to one very

¹ Huxley (T. H.), Trans. Internat. Congr. Prehist. Archaeol., Sess. 3 (1868), p. 92.

² Murray (A.), "Geogr. Distrib. Mammals" (1866), pp. 56 *et seq.*

³ This word has been substituted for Melanochroi, in order to avoid confusion with Professor Huxley's Melanochroi.

⁴ Prichard (J. C.), "Nat. Hist. Man," 3rd edition (1848), p. 274.

similar to that of the ancient Egyptians." Nevertheless, the physical characters of the Berber, doubtless at the present day largely influenced by admixture with Arab blood, leave us in great doubt as to the origin of the race, and perhaps from facial and craniometrical characters we are hardly justified in assuming more than that degree of Negroid influence which close proximity would readily account for.

Included in the Berber tribes are the Libyans and the Nubians, whose African origin is hardly disputed, though the woolly hair of the *Æthiochroic* group gives place to hair which is generally described, not as woolly, but as "crisped," and this crisped hair is to be found, more or less, amongst all the North African peoples. Moreover, the Berbers of the Higher Atlas are stated to differ entirely from the Arabs and Moors, and it has been claimed for them that they represent the aboriginal inhabitants of the country; while the Shuluh tribes of the Northern Atlas have been satisfactorily proved to belong to the same group, the two languages being unquestionably cognate dialects. If then it can be maintained that these Berbers are neither Arabs nor Moors, we are surely justified in classing them with the true African races, with which their physical characters in many respects connect them; but there still appears to be an element in this Berber race which cannot be satisfactorily determined, though the "aboriginal" theory does not deserve to be entirely ignored.

It must not from the foregoing remarks be supposed that I wish to maintain the *pure* *Æthiochroic* origin of these North African races, my desire being simply to prove that a Negro race has in a very marked degree affected their character; so much so, indeed, as to warrant our supposing that a part at least of this region was once inhabited by the black races. And so with their near neighbours, the Nubians of the Red Sea and those of the Nile, who are described as dark, almost black in colour, and possessing hair which is frequently crisped and thick, and has sometimes even been observed to be woolly, its appearance giving rise to a comparison with that of the Negroes of Guinea, from which, however, it is said in some unexplained manner to differ.

Finally, it has been remarked by Prichard,¹ and confirmed by many later writers, that though the typical woolly hair is generally associated with the Negro of Africa, yet, "if we take the entire mass of the black native races of Africa into comparison, we shall find tribes amongst them who, similar in complexion and in most other physical peculiarities, yet differ in regard to

¹ Prichard (J. C.), "Nat. Hist. Man," 3rd edition (1848), p. 99.

their hair, and present every possible gradation, from a completely crisp, or what is termed woolly hair, to merely curled and even to flowing hair." Hence we may, I think, fairly assume that though the woolly hair regarded as typical of the African Negro may be taken as evidence of the *Æthochroic* origin of the races in which this peculiarity is remarked, yet its absence can hardly justify us in rejecting from the *Æthochroic* group such races as, but for this characteristic, possess unmistakable Negro features, whether of face or form.

The foregoing facts present us, I think, with evidence sufficient to prove that at some time since Africa was first populated by man an intimate relation existed between the southern portion of the continent and the north-eastern border, and that throughout Abyssinia, Nubia, and Egypt extended a branch of that *Æthochroic* group of which the African Negro is the best available example.

Concerning the existence of the *Æthochroic* group in Arabia, I have hitherto been unable to find any very conclusive evidence, yet indications are not wanting of an African type in that country. M. de Pagés affirms that the Arabs inhabiting the middle of Arabia "have the locks somewhat crisped, extremely fine, and approaching the woolly hair of the Negro," while Mr. Palgrave,¹ though he expresses himself as strongly opposed to the notion that the Omanees, or indeed any "of the Khatanee stock, of which they are perhaps the most authentic representatives," have anything in common with the Negro, yet emphatically pronounces them to "belong to the African Abyssinian family," and conjectures that they "migrated at an early period into Arabia from the West, across the Straits of Bab-el-Mandeb."

It is, however, quite as probable, it seems to me, that they are a remnant of the *Æthochroic* group which formerly occupied the whole region, and that the sea-barrier which now separates Africa from the Arabian peninsula did not formerly exist. There is, I confess, no evidence in support of this, as opposed to the view maintained by Mr. Palgrave, but the Arabs are not generally regarded as very tolerant of foreign intruders, and the prospects of a small incursive tribe of Africans would probably be anything but hopeful in their midst. Supposing them, however, to have been the original possessors of the soil, we may well conceive that, though driven back from the more fertile tracts, they might still preserve a precarious existence in the interior, and in process of time, and by an almost imperceptible mixture of blood, acquire so much of the Arab character that their original African or rather *Æthochroic* descent would be

¹ Palgrave (W. G.), quoted by Murray (A.), "*Geogr. Distrib. Mammals*" (1866), p. 412.

ignored or even forgotten by their Arab neighbours. I do not, however, regard as of great moment the present existence of the *Æthochroic* type in Arabia, for even admitting its presence we have still an enormous gap existing between this and the nearest Eastern appearance of the *Æthochroic* group in India.

That in the mountains of the Dekkan certain black races existed, which could be referred to none of the civilised races of Hindustan, has long been known, but the information which has been gathered together on this point is far from complete, and perhaps the difficulty of referring them to any other race first induced anthropologists to look to Africa or to Australia for their nearest allies. The best known of these tribes are the Kulis, the Bhils, the Gonds, and the Konds, all of whom seem to be characterised by the large mouth, the thick, more or less protuberant lips, the broad, compressed nose, and the high cheek-bones which are seen in the Negro races. The skin is generally black, or nearly so, though this is not by any means a fixed character. The hair is also black, but has never been stated with certainty to present the woolly character of the Negro; but I would mention that to the best of my belief I have myself seen natives of India with unquestionably woolly hair. The reiteration of the contrary statement has, however, so unsettled my mind on the subject that I should now be loth to pronounce with certainty upon so simple a question. I hope, however, shortly to obtain evidence on this point which may be conclusive.

Of one of these Indian black races, inhabiting the Nalla Malla, or Black Mountains, Captain Newbold has stated that they have long bushy hair, thick lips, and high cheek-bones; but this is not a very accurate description, and though it would not apply to the ordinary Hindu, yet would not justify our referring the race to the *Æthochroic* group. There is, I think, an element of uncertainty introduced into the discussion of the characters of the hill-tribes of India in consequence of the use of this term "hill-tribes." Thus Major-General Briggs, in his report, includes the Kukis, Garos, Khasias, and apparently the other tribes of the Assam Hills amongst the hill-tribes of India, and herein he is unquestionably in the right. But there could be no greater racial difference than exists between the hill-tribes of Assam and those of the Dekkan, the former being, in feature, language, and manners, of undoubted Mongolian origin,¹ and when, therefore, an attempt is made to generalise the descriptions of the hill-tribes as parts of a whole, serious error is un-

¹ The tribes to which I especially refer are the Kukis, Nagas, Khasias, Garos, Luchais, Kacharis, and Manipuris, all of whom I have frequently come in contact with.

avoidable. Unfortunately, Professor Huxley has regarded the Dekkan tribes as other than of *Æthochroic* origin, or rather as differing essentially from the African Negro. As, however, he has included them in his Australioid division, I do not, as will be presently seen, regard this as a serious difference of opinion, inasmuch as there seems to be no reason to separate the Australians from the remainder of the *Æthochroic* group.

Extending to the eastward of India, similar races are said to be, or to have been present in Burma, Siam, Cochin China, and China,¹ but beyond simple assertion I have been able to obtain little evidence of the correctness of the statement, which, however, on *prima facie* grounds, we have no reason to doubt.

Of the affinities of the Mincopies of the Andaman Islands there is no doubt. Professor Huxley and Sir Richard Owen, amongst others, express themselves very strongly as to the "Negroid" origin of the Mincopies, and this alone being granted would be sufficient upon which to found the theory that they had also at one time occupied the mainland, or at least land which had formerly an extension both towards Africa and towards the Philippines and other Pacific Islands. The physical characters of the Andamanese are essentially *Æthochroic*, though there are points of divergence, and these are, some of them, of remarkable persistency. There is amongst the Mincopies a singular uniformity of type, the variations which can be observed in individuals being extraordinarily small. And the type agrees in most essential points with Professor Huxley's Negroid division. The skull is indeed brachycephalic, but not in an extreme degree, the index being given as 81·87. This is obviously against the *Æthochroic* origin of the race; yet we must not forget that equal variation is to be observed in true Negroes.

To the south-east of the Andamans, in the Malay peninsula, the *Æthochroi* unquestionably appear, as is indeed generally admitted by ethnologists, whatever may be their views concerning the affinities of the nations still more to the south. According to Professor Huxley the group occupies, besides the Andamans, the Malacca peninsula; the Philippines and the islands of the eastern part of the Malay archipelago; are again found in New Guinea; and thence stretch as far as the Fijis; and are finally to be identified in Tasmania. Unfortunately there exists some diversity of opinion concerning the affinities of the black races of Oceania, though the prevailing view appears to be in favour of their unity of origin.

Mr. Wallace,² who had, however, no opportunity of himself

¹ Murray (A.), "Geogr. Distrib. Mammals" (1866), p. 66.

² Wallace (A. R.), "Trans. Ethnol. Soc. Lond.," vol. iii (1865), p. 209.

examining them, affirms that between the Negritos and Samangs of the Philippines and the Malay archipelago, and the Papuans, there is "no affinity or resemblance whatever." He states, however, that "the hair of these dwarfish races agrees with that of the Papuans, but so it does with that of the Negro of Africa. The *Negritos* and the *Samangs* agree very closely in physical characteristics with each other and with the Andaman Islanders, while they differ in a most marked manner from every Papuan race." Notwithstanding the difference which exists, the Papuans must still, I think, be referred to the *Æthochroic* group. They possess the frizzled hair of the Negro races; the skin is of a colour "approaching but never quite equalling the jet-black of some Negro races;" the limbs in their length and tenuity resemble those of the Negro; the hands and feet are large; the mouth is large, and the lips are thick and protuberant. The nose, however, is anything but Negroid in form. Mr. Wallace describes it as "large, rather arched and high, the base thick, the nostrils broad with the aperture hidden, owing to the tip of the nose being elongated." Thus in Mr. Wallace's description the only character which does not, more or less, agree with the *Æthochroic* type is the nose, and even this in the skull would probably not differ greatly, if at all, from the nasal bones of the Negro, the nasal index in the black races of Oceania generally being even greater than in the Negroes of Africa.

Whatever may be the Papuans—and there can, I think, be little doubt that they are essentially *Æthochroic*, notwithstanding the nasal difficulty—the existence of *Æthochroic* races in the other islands of Oceania and in the Malay peninsula is certain.

The so-called Pelagian Negroes are stated by Prichard¹ to "have short crisp or woolly hair, and bear altogether a considerable resemblance to the Negroes of Africa;" these are typically referred to the Philippine Islands, but they are scattered throughout the whole area, differing to a greater or less extent from the true Negro, but yet presenting us with an aggregation of characters sufficient to justify our placing them with confidence in one and the same group. It must, however, be understood that I do not claim for any of the Oceanic races absolute purity of blood, though the admixture, if it exists, need not be very great.

Finally, we have to consider the inhabitants of the Australian continent, concerning whom there is not a little difference of opinion. Professor Huxley has regarded them as differing to such an extent from the nations around them, that he has

¹ Prichard (J. C.), "Nat. Hist. Man.," 3rd edition (1848), p. 22.

constituted them a group alone—a group to which he attributes a singular extension. Occupying only the continent of Australia in the south, he identifies with them the black races of the Dekkan, and perhaps those of Abyssinia and Egypt, while he suggests a possible extension through Western Asia, and along the two shores of the Mediterranean.

Mr. Oldfield,¹ in his account of the "Aborigines" of Australia states that there "can be little doubt that the New Hollanders are mainly of Malay descent, the physiognomy of Malays and Australians being essentially the same. . . . But although the Alfouira must be considered principally of Malay origin, it seems probable that there has been a mixture of Negro blood." This is, I think, exactly the reverse of the truth.

There are some striking characters which serve to bring together the Negro inhabitants of Africa and the "Negroid" and other races of Australia and the Negrito Islands. The skull is in both cases markedly dolichocephalic. Thus the cephalic index of a group of Australians was found to be 71·49;² of a group of New Caledonians 71·78, and of a group of Hottentots, Kaffirs, Bushmen, and "Negroes," 72·78. These figures place them at the very summit of the dolichocephalic races, the only people approaching them being the Eskimos, with an index of 71·71.

M. Broca has also attached great importance to the nasal index, that is, the proportion of the breadth to the length of the anterior nasal orifice—a character which, in some of its developments, has been regarded as indicating a transition between man and the apes. The figures in M. Broca's tables of this index vary from 72·22 to 35·71, and these forms he divides into three groups: the mesorrhines, including the indices between 48 and 52; the platyrrhines, including those from 53 upwards, and the leptorrhines, including those from 49 downwards. Thus separated we find that the white races (Leucochroic group) are leptorrhines; the Mongols and Americans (Mesochroic group), with the exception of the anomalous Eskimos (42·33), mesorrhine; and the black races (Æthochroic group) platyrrhine. This general agreement is the more interesting when it is remembered that M. Broca regarded the nasal index as one of the safest racial tests. Certain tables of this measurement show that the nasal index of Negroes and other African races is 55·44; of Tasmanians, Australians, and New Caledonians, 54·66; while that of a number of Mongolians and Americans ranged between (Japanese) 51·47 and (Eskimos) 42·33.

The question of language is one which of course in an area of

¹ Oldfield (A.), "Trans. Ethnol. Soc., Lond.," vol. iii (1865), p. 215.

² Broca (P.), "Rev. d'Anthrop.," vol. i (1872), p. 385.

this kind deserves special attention. An eminent authority has thus pronounced upon this subject:¹ "Whatever the Papuan and Australian languages may be like, or unlike, they are more like one another than aught else; they are also more like the Malay and Polynesian, however little or great that likeness may be. . . . And in like manner, whether the likeness be little or much, the Malay languages are liker to the southern members of the monosyllabic class than to any other forms of speech." The arguments by which Dr. Latham supports this view are not here required, but if not conclusive, they appear at least to be cogent, and should not be rejected, except upon the strongest grounds. I have quoted this passage in support of the view I entertain, that in the Oceanic area the language has been influenced to a large extent by contact, but not to a large extent by admixture with the Malay races; but this question will be again referred to hereafter.

From the researches of Sir George Grey² and others, there can be no doubt as to the practical unity of the Australian dialects, for the recurrence of the same words with the same signification can "be traced, in many instances, round the entire continent, but undergoing, of course, in so vast an extent of country, various modifications." Further, he remarks that the same names of natives occur frequently at totally opposite portions of the continent, and from the fact that the natives name their children from any remarkable circumstance which may occur soon after their birth, he concludes that the "accordance of the names of natives is a proof of similarity of dialect." It has occurred to me that the slight change which thus appears to have taken place in the language of widely separated tribes may be due, to no small extent, to the peculiar marriage laws which exist throughout the continent, which themselves may be regarded as an argument in favour of the original unity of the stock, were any argument needed beyond physical structure.

In support of the view that the Negroes of Africa are related by language to the Australians, Mr. Murray³ instances the fact first noticed by Mr. Earl, that in the "Crocker Island dialect a cluck occasionally occurs in the middle of a word, which is effected by striking the tongue against the roof of the mouth." This peculiarity is also characteristic of some of the South African tribes, and notably of the Zulus, but whether it can be regarded as proving any, even the most remote connection between the two peoples it would be rash to decide.

¹ Latham (R. G.), "Elements of Comp. Philology" (1862), p. 370.

² Grey (Sir G.), "Journals of two Expeditions of Discovery in North-West and Western Australia" (1841), vol. ii, pp. 208 *et seq.*

³ Murray, (A.), "Geogr. Distrib. Mammals" (1866), p. 61.

As regards physiological characters, the singular change which occurs in the colour of the skin, hair, and eyes in African Negro children is well known, and it is interesting to observe that the "children of the Australians¹ immediately after birth are yellowish brown, and become dark at a later age," so that throughout the black and dark-coloured races there appears to be a tendency on the part of the children to display a somewhat lighter hue than that of the parents.

Having now glanced rapidly at the characters of the people whom I regard as possessing unquestionable *Æthochroic* affinities, it is necessary to consider the area in which they occur. I do not, however, wish it to be supposed that I desire to fix the starting place of the black races, which I think is a matter of little consequence in considering their distribution. We have seen that indications of races which may be classed in the *Æthochroic* group exist in South Africa, in Egypt and Nubia, in Arabia, in India, in the Andaman Islands, and the Malay peninsula, in the islands of Oceania and in Australia, while there is some evidence of their extension to Cochin China. The changes in physical geography requisite to bring all these places into communication are far from great. An elevation of only one hundred fathoms would join into one extended peninsula all the islands from Cochin China to Java, including Borneo; New Guinea would be joined to Australia, and the narrow seas which would exist between the remaining islands would offer no great barrier to the migration of man, even when his means of ocean transit were of a very primitive order. A yet greater elevation, but still one of no very great extent, geologically considered, would convert the greater part of the Bay of Bengal into dry land, and join the Andamans by a land passage to India; while an equal rise to the west would join India and the Laccadive and Maldivé Islands to Arabia, converting the Arabian Sea into a broad expanse of nearly level ground. And an elevation of less than a thousand feet would obliterate the barrier formed by the Red Sea between Arabia and Eastern Africa. All these imaginary changes are as nothing compared to the changes which we know to have occurred in the levels of land surfaces, and they are sufficient to account for the easy migration of a race located in any part of the area.

But we have also to consider the limitations of the *Æthochroic* group. In the south, both in the African and Australian regions, its extension is interrupted only by the open ocean, but on the north the land is continuous; yet it is easy to fix boundaries beyond which the group has *not* extended. And these boundaries agree in a remarkable manner with the natural

¹ Darwin (C. R.), "*Descent of Man*," 2nd edition (1875), p. 557.

boundaries which either exist at the present, or which we have excellent grounds for believing have formerly existed. From the Cape de Verde to the neighbourhood of the Nile probably extended a no longer existing sea, cutting off from Southern Africa the whole of Barbary, but still leaving the communication open between Abyssinia and Egypt, and the supposed southwestern extension of Arabia. Thus Europe would be effectually separated from Africa, except at one point—the Dardanelles. And of what nature the barrier at this point could be, it is difficult to decide. Possibly the Mediterranean and the Black Sea may have been continuous, instead of being joined only by a narrow strait; or possibly again, the Taurus may, under different conditions, have offered a barrier greater than at present to the progress of man. This, however, appears to be the one break in the continuity of the northern barrier—a break which the geologist may be able to bridge over.

Between the Black Sea and the Caspian we have the Caucasus, offering probably, under other conditions, an impassable barrier, and thence, stretching from Armenia in the west, to near the source of the Oxus in the east, and cutting off from Northern Asia the tableland of Persia, is the chain of the Paropamisus. Whether, however, this was the retaining barrier, or whether the lesser heights of the Zagros Mountains, running from Armenia to the confines of Hindustan, were the original boundary of the *Æthochroic* group, I shall not attempt to decide. Neither would at the present offer an impenetrable barrier; but either might, under easily conceived changes of physical geography, become such a barrier. Thence we have the Suliman range and the great chain of the Himalayas; while eastward, either in Cochin China or in China, we find many possibilities, but no certainties. Possibly the Yellow Sea once covered the bed of the Yangtse Kiang, or of the Hoang-ho, when that and the Yun-ling chain would form an effectual barrier. At all events we are, I think, justified in assuming, from the present extension of the *Æthochroic* group, that the boundary was not placed northward of this point. Thus we have an area to no small extent demonstrably cut off from the northern regions of Asia and Europe, in which alone traces of the *Æthochroic* group are to be met with, and the *Æthochroic* peoples were, I believe, originally the sole occupiers of this area.

And I think that the distribution of the lower mammals over the area affords striking evidence in favour of this view, though some remarkable contradictions certainly occur.

In considering the question of the geographical distribution of other mammals, some allowance may be made for breaks of continuity in their range, which cannot be accounted for on

geographical grounds, and which therefore we may believe to be accidental. When, for instance, we see the Old World monkeys spread over Africa, the southern part of Arabia, India, Burma, China, and the Malay archipelago, it is reasonable to suppose that they must at one time at least have occupied a portion of Beluchistan, or of some land area continuous between Arabia and Hindustan. Let us then see what evidence is afforded upon the point by the geographical distribution of mammals¹ in the area in question.

First with regard to the highest order of the mammalia—the monkeys. The Catarrhine monkeys, as a whole, occupy the area which I have assigned to the *Æthochroic* races of man, with some important exceptions and differences. They are not to be found in Persia and Beluchistan, where the black races of man are also absent, and they are not to be found in Australia or New Guinea, or in the islands of Oceania (with some exceptions), south and east of Java, and the Celebes. Nor do they now occur in China north of the Yangtse-Kiang, but they are found in Japan and the neighbouring islands. I think from this we are justified in assuming that from Eastern Africa to Japan the Catarrhine monkeys formerly ranged without a break, and the hiatus in Persia, as well as that in China, we may allow to be due to accidental causes. Then we have to account for the sudden disappearance of the group beyond Java and the Celebes, and this I think may be easily done. We have seen that a peninsula probably formerly extended from Malacca and Cochin China to Java, and included just those islands which are now occupied by the Catarrhine monkeys, and I suppose that man, by means of rafts or boats, however rude, was able to pass the barrier presented by the narrow straits between island and island, while the same barriers would be absolutely insurmountable to the apes and monkeys. How to account for the distribution of the different groups of the Catarrhini, however, is less obvious. We find the anthropoid apes in West Africa, and in Borneo and Sumatra, but the passage across the Indian Ocean is indicated only by the presence of the gibbon, a doubtful anthropoid, in Assam and the neighbouring countries. Again, the baboons occupy South Africa and Arabia, and only appear again in the Philippines and Celebes. But at least they do not extend beyond the line which I have assumed to be the limit of the *Æthochroic* group of peoples.

The evidence afforded by the present distribution of the leopard is equally significant. Whether there is but one species,

¹ Murray (A.), "Geogr. Distrib. Mammals" (1866), *passim*. Nearly the whole of the facts of geographical distribution are derived from Mr. Murray's volume, although I have also availed myself of Mr. Wallace's work.

or whether there are two, or more, is a question still, I believe, undetermined, but the differences in the species described are so small that for the present purpose they may be safely ignored. We see then that the leopard extends over the whole of Africa, through Arabia, Asia Minor, Persia, and Beluchistan, to the Indian peninsula. Thence eastward it is found as far as China, and it extends southward to Borneo and Java, but is not found in the Celebes, or in the islands to the south and east. It occupies, then, just that area in which the *Æthochroic* group of peoples is found, with two exceptions. Australia and the islands to the north are without the leopard; North Africa, to which the black races did not probably *originally* extend, possesses it. Its absence in Australia and the islands may be explained on the same theory as the absence of the monkeys. Its presence in North Africa may reasonably be supposed to be due to a westward extension, subsequent to the elevation of the Saharan plateau, just as the marked Negro characters observable in the North African races may be attributed to a similar extension.

The evidence afforded by the civets and ichneumons is the same as that afforded by the leopard, except in so far as these extend into Spain and European Turkey, and beyond Borneo into New Guinea. Though no species seem to be common to the Indian and African areas, yet some of the genera are so.

The distribution of the jackals is precisely that of the leopard, except that there is an extension to the Celebes.

The otters afford by no means identical evidence, but while certain forms range between Western Africa and Borneo, with various breaks, it is to be observed that the common European species, *Lutra vulgaris*, does not, except in North Africa, extend south of the line which has been conjectured to define the original distribution of the *Æthochroi*. The distribution of the existing *Edentata* is identical with that of the *Catarrhine* monkeys, except that they are absent in Arabia, part of Western India, and Japan.

The rhinoceros is found in South Africa, in India, Siam, and Cochin China, and thence southward to Java; but in the fossil state it is found throughout Northern Asia and Europe, as well as in North America. But the fossil species nowhere extended south of the assumed *Æthochroic* barrier, and the existing species nowhere exist to the north of it, while the whole breadth of Central Asia and the Sahara separates the two areas. And I would here observe that it does not appear to me that our views concerning the distribution of man should generally be influenced by the distribution of fossil species of the lower mammals; for if we allow that man was the latest comer, we must admit that his

migrations, and, to some extent, the migrations of other existing creatures, would be influenced by the same causes, while anterior migrations of the lower mammals might have been influenced by an entirely different order of things.

Many instances might yet be given, tending to prove that at one time or another a barrier more or less complete has existed along the line already indicated, sufficient to oppose the passage of man and of the land mammals, though it must be admitted, on the other hand, that the distribution of some mammals is, at first sight at least, somewhat opposed to this view, and we are forced to infer, though the evidence is hardly conclusive, that the extension is due to alterations later or earlier than those which influenced the primary distribution of man.

I have now gone over the arguments in favour of the limitation which I have ventured to suggest of the original distribution of the *Æthiochroic* races, and I think I have shown that it is not only a possible but a probable limitation.

As regards the present purity of the *Æthiochroic* group I do not pretend to speak with any certainty, but I should suppose that in Africa is preserved one development of the pure black blood, while probably in the Philippines and some other of the eastern islands, and in the Andamans, another development, pure, or almost pure, still exists. In North Africa, in the islands of Oceania, and in Australia, we have probably certain results of crossing, more or less complex, but to this point I shall refer more particularly hereafter, when I come to discuss, more briefly I hope, the distribution of the two remaining groups.

Leucochroi.—The races included in this group are for the most part recognised by all ethnologists, and it is therefore needless to enter at great length into a discussion of their characters. That there are, however, remarkable divergences amongst many of these races is evident, but these have by Prichard¹ been explained away by "reference to climate, and to diversity of food and manners." Whether such influences alone could have produced variations so remarkable is, I think, more than doubtful, for the nations forming the group to which the unfortunate term "*Caucasian*" has been applied, have probably in the progress of ages undergone greater changes, due both to local conditions, and, I should imagine, to more or less complex crossing, than those of either of the other groups, and in it we are now forced to include such widely divergent types as the Hindu, the Circassian, the Jew, the Arab, and the European. And these types it is impossible to separate by any line which can be deemed satisfactory, though the typical characters of each are so well marked that it

¹ Prichard (J. C.), "*Nat. Hist. Man*," 3rd edition (1848), p. 139.

is easy to separate them into tolerably definite and homogeneous nations. With these minor divisions we have, however, nothing to do, so long as we admit that a white group exists, equivalent in value to the *Æthochroic* group already discussed, and this is, I think, generally admitted by all ethnologists.

The present distribution of the *Leucochroi* is also, I think, an undisputed question—at least it is, in its broader aspect, sufficiently so to render any lengthy discussion unnecessary. I assume the white European to be typical of the group, as it at present exists, though every intermediate hue, almost to the blackness of the Negro, is to be met with.

Roughly speaking, the *Leucochroic* group occupies the whole of Europe, with the exception of a part of the northern portion, and certain indefinite areas such as Hungary and parts of Russia, but that it was the original population of this region is, I think, more than doubtful.

To the eastward of the European area we find undoubted *Leucochroic* peoples upon the western slopes of the Caucasus, in Armenia, in Persia, in Georgia and Circassia, in Afghanistan, in Kashmir, and in Hindustan. Further, we find that at Kattiwar, in Northern India, and in Rajputana, the natives frequently have light hair and blue eyes, and present unquestionably the typical *Leucochroic* characters. To the northward, again, beyond the Himalayas, in the Hindu Kush, or, as it is called, the Indian Caucasus, is another tribe of *Leucochroic* people, the *Siah Posh Kafirs*, retaining their Sanscrit language, or at least a language cognate to the Sanscrit, and presenting characters of feature and complexion comparable to those of the fairest of Europeans. Though various origins have been proposed for these tribes, such as Arab, Hindu, and Zoroastrian, yet Dr. Leitner,¹ who has devoted immense labour to their history, regards them as the aborigines of the country, and considers "that if they are not the ancestors of our Aryan race, they are certainly in an equal relationship, as far as languages go, with the Sanscrit." Further, in China, it was noticed, so long ago as the time of Macartney's Embassy, that a fair race of people, resembling Europeans, was located upon the banks of the Amour, who were nevertheless regarded as Tartars. In his account of his journey, Sir John Barrow² says that amongst the *Man-tchu Tartars* he observed "several, both men and women, that were extremely fair and of florid complexions; some had light blue eyes, straight or aquiline noses, brown hair, immense bushy beards, and had much more the appearance of Greeks than of Tartars." He further describes

¹ Leitner (G. W.), "The *Siah Posh Kafirs*" (*Journ. Anthropol. Inst.*, vol. iii (1874), p. 356).

² Barrow (J.), "Travels in China" (1804), p. 185.

the language as full and sonorous, and "more like the Greek than any of the Oriental languages. . . . It is alphabetic, or, more properly speaking, syllabic, and the different parts of speech are susceptible of expressing number, case, gender, time, modes of action, passion, and other accidents, similar to those of European languages."¹ Yet it does not appear to have occurred to ethnologists until long afterwards that these people were a remnant of the so-called "Caucasian" races still occupying a portion of the original home of their ancestors, though, indeed, a Greek origin has been attributed to them, notwithstanding all the difficulties of physical geography, and the geographical distribution of other races. Nor, perhaps, with the time-honoured theory of the West Asian origin of the Leucochroic group ever before them, can we be surprised that ethnologists should hesitate to regard them as a still surviving outlier of that group.

Of these people there seems to be but a remnant, and another remnant is apparently to be met with in the south-east of China. To the west of the kingdom of China, however, we have historic evidence of the existence of a nation presenting us with some characters which may be identified as belonging to the Leucochroic peoples. The kingdom of Woo-sun, occupying apparently the modern province of Ili, to the east of Lake Issikul, contained a population of no less than 630,000 persons (207 B.C. to 9 A.D.), who are described as having blue eyes and red beards, and who in their manner and customs certainly present a marked contrast to the Chinese. It might of course be argued that these people had migrated from the west towards the confines of China, but that we are told² that the "nation was originally settled, together with the Ta Yuě-she between the Tun-hwang and China," so that it is clear they had migrated from east to west, and not from west to east.

Another and most important indication of the presence of the Leucochroic group in this region is to be found in the island of Yeso, in the immediate vicinity of the Amour River. The Aino of Yeso, and other of the islands to the north of Japan, have frequently been referred to the same type as the Japanese, and though until lately little appears to have been certainly known regarding the structure or the vocabulary of their language, yet what was known was doubtfully referred also to the Japanese family of languages. There seems now, however, to be no doubt that the language at least of the Aino has not the slightest affinities with the languages of the neighbouring Mongolian races, and indeed appears to have few affinities with any known language.

¹ *Ibid.*, p. 270.

² Wylie (A.), "Notes on the Western Regions" ("Journ. Anthropol. Inst.," vol. xi (1882), p. 84).

Nevertheless it has been stated by Klaproth that there is not a little connection between the language of the Aino and that of some of the Samoiedes, as well as between these and some of the dialects of certain Caucasian tribes; but what this connection is worth I cannot say. That the Aino language is, however, of a remarkably primitive type seems to be generally admitted by philologists, and the want of traceable affinities is therefore the less to be wondered at. Nor would it prove much were the Japanese elements far more pronounced than is in fact the case, for it would be by no means singular that a neighbour so near at hand, and so superior in culture, should during the course of centuries have influenced to some degree the language of an inferior and probably a defeated race.

The true affinities of the Aino are then to be sought in the physical characters alone, and these point conclusively to a Caucasian, or, as I should prefer to term it, a Leucochroic origin. Scheube¹ gives his opinion on this question as follows:—"I cannot discover the Mongolic type in the Ainos. The great development of the hair, the disposition of the eyes, the nasal formation, the moderate breadth between the cheek-bones, the absence of prognathism, are all so many traits separating them from the Mongolians." The evidence of other ethnologists upon this point is equally strong, and may be regarded as conclusive.

It has also been observed that people presenting striking Aino peculiarities have been detected at the extremity of Kamchatka, throughout the Kurile Islands, and in the neighbourhood of the Hingpu River and Castries Bay, near Sakhalin; while in a southerly direction they can be traced as far as the latitude of Tokio.² The descriptions indeed of the older writers are often very misleading, some affirming the Aino to be black, some dark, and some light copper-colour; but the "Caucasian" cast of countenance was very early recognised, and does not seem ever to have been disputed.

The foregoing facts have led me, after no little hesitation, to believe that the home of the Leucochroi is to be looked for, not in the neighbourhood of India or the Hindu Kush, or in the Caucasus, or in any western part of Asia, but in the very heart and centre of the area at present occupied by the typical Mongols.

The singularly isolated position of the great central plateau of Asia has been accurately described by Sir Richard Temple.³ It

¹ Scheube (B.), "Die Ainos" (1882), p. 3, quoted by Professor A. H. Keane in "Nature," vol. xxvi (1882), p. 525.

² Keane (A. H.), *loc. cit.*

³ Temple (R.), "Brit. Assoc. Report" (1882), p. 613.

is enclosed more or less completely by six great chains of mountains—the Himalayas, the Pamir, the Altai, the Yablonoi, the Yun-ling, and the Inshan and Khingan; and the altitude of these great chains is generally such as to render them quite impassable. But to the west, lying between the Altai and the Thian-Shan, is a detached depression, known as the Zungarian Strait, which is little more than 2000 feet above the sea-level. This depression, says Sir Richard Temple, "is geographically important as forming the only broad pass between our plateau and the world without. Great value was, in early times, attached by the Chinese to it, as being the only natural highway on a large scale between Northern and Central Asia." And in late historic times it was, as we know, by this path that Genghis Khan and his successors swarmed into Western Asia, and thence into Europe, until they reached at least as far as the confines of Hungary. On the north and on the south the barriers presented against the passage of man may be regarded as insurmountable, but in the east again, and especially "on the north-east, between Mongolia and China, there are several passes that have witnessed the historic outpourings of the Mongol hordes," and these passes were so practicable that they could never probably have presented any serious difficulties to the advance of incursive tribes.

Thus it is certain to demonstration that from the China Sea in the east, to the Caspian in the west, a road was open for the progress of man, which presented no insurmountable obstacles, but which has in fact been traversed by conquering hordes of Mongols, and we are therefore freed from the danger of error in assuming possibilities which might perhaps have no existence.

Whether the passes lying between the Khingan and the Yablonoi ranges, through which the Amour flows, are equally practicable, I have been unable to discover; but the mountains on the western frontier of Manchuria appear to be of no great height, and would not probably present any very serious barrier. I think it is then fair to assume that a race of people having access to the eastern coast of Asia might without difficulty have penetrated into the interior, and this being granted the physical formation of the district renders it impossible to assign a limit to their western extension. I believe, therefore, that the Leucochroic group of peoples formerly occupied the plateau of Central Asia, as defined above, and extended also along the eastern coast of Asia from Kamchatka on the north to the northward limitation of the *Æthochroi*, wherever that may have been, on the south. The islands of Japan, as well as those of Yeso and the Kuriles, seem also to have been populated by the *Leucochroi*; but we nowhere find indications of them south

of Eastern China, where their presence is by no means well ascertained, and we are therefore, as it seems to me, justified in affirming that the northern barrier of the *Æthochroi* formed the southern barrier of the *Leucochroi*.

From this region the *Leucochroic* races seem to have passed westward by the depression already referred to, south of the Altai range, and to have gradually overrun first Western Asia, and eventually nearly the whole of Europe, sometimes exterminating, sometimes mixing with the people already inhabiting the country. Though the main stream of migration doubtless followed the route which lay immediately before them, to the north of the Aral, the Caspian and the Black Seas, yet some doubtless penetrated southwards, and in very early times probably occupied the great tableland of Persia, and thence penetrated into the north of India, the traditions of the Hindus seeming to point to Afghanistan as the original dwelling-place of their ancestors.

As in considering the distribution of the *Æthochroic* group I availed myself of Mr. Murray's maps of the geographical distribution of mammals, so with regard to the distribution of the *Leucochroic* group I shall endeavour to prove that the boundaries which I have assumed are in fact natural boundaries, which have influenced the distribution of other animals as well as man.

The distribution of the true wolves represents very exactly the distribution which I assign to the *Leucochroic* group of peoples. On the north they extend from the most eastern extremity of Asia, in the neighbourhood of Kamchatka, to the northern coasts of Lapland, while on the south they range from Japan and the Corea in the east, northward of the Himalayas, into Persia, and thence, avoiding Arabia, but passing through Anatolia, they occupied the whole of Europe. That they extend far to the northward of the supposed *Leucochroic* area is obvious, but this I should be disposed to attribute to dispersal during comparatively recent times, though it must not be forgotten that the important boundary is the southern and not the northern one, and on the south the boundary is very much that which I have suggested. The main extension is to the north of the Caspian, though there is a minor extension into Persia, and thence westward to the Dardanelles, but nowhere does the wolf penetrate so far as Africa, and he does not even appear to have crossed the Pillars of Hercules. The presence of wolves in America I shall have to refer to when I come to discuss the remaining group. To the distribution of the common otter, *Lutra vulgaris*, I have already had occasion to refer. Though extending far to the north of the assumed *Leucochroic* boundary

in Asia, it does not, in any essential degree, penetrate to the south, being just indicated to the south of the Caspian and in Asia Minor. It, too, occupies the islands of Japan and the Kuriles. The sheep to some extent follow the same course. They are found in Eastern Asia from Kamchatka to the Corea. From Corea they follow the line of the Himalayas, and from the west extend into India. Thence they are found to the south and west of the Caspian, but they nowhere touch the shores of the Arabian Sea, and finally they are found in detached areas in the extreme west of Asia Minor, in European Turkey, in Corsica and Sardinia, and in the south of Spain. Though these belong to several species of the genus *Ovis*, they are all very nearly allied, and some question seems to have been entertained as to the specific distinction between some of them.

The distribution of the moles is also noteworthy. The European mole occupies the whole of Europe south of Finland, and in the south passes through Asia Minor, part of Persia, and Afghanistan, and is found throughout India south of the Ganges. Thence passing to the west and north of the Hindu Kush it extends to the north of the Altai range, and also through the great depression to the south of the Altai, already referred to, into the centre of the great Asiatic plateau. Here it seems suddenly to disappear, but its place is immediately taken by another, and very similar species, *Talpa wogara*, which extends to the eastern shores of Asia, between the mouth of the Amour on the north, and the Corea on the south, and occupies also the island of Yezo, while an almost identical species is found in Japan.

The distribution of the marmot affords evidence very similar to that afforded by the wolf. In Eastern Asia it stretches from Kamchatka in the north to the Corea in the south, passes to the northward of the Himalayas, thence passes through the western depression between the Altai and the Thian Shan, and so onward to the north of the Caspian, into Europe. The distribution of the marmot is the more interesting in that it occupies the whole of the Central Asian plateau, and though it passes to the north of the Leucochroic boundary, yet in the south nowhere encroaches upon the *Æthochroic* area, but directly extends, as I believe the main migration of the Leucochroic group extended, into the heart of Europe to the north of the Caspian.

My object in the foregoing remarks has been to show that in the migration of animals between Asia and Europe the general direction was through the Thian-Shan-Altai depression, and to the north of the Caspian. That there was generally also an extension in a northerly direction does not appear to me materially to affect the question, while the occasional extension

to the south, sometimes into India, sometimes into Persia and Afghanistan, may, I think, fairly be regarded as subordinate migration. The way in which the marmot penetrates to the eastern slopes of the Hindu Kush, and then as it were retraces its steps to exude at the great Altai pass so often mentioned, affords, I think, striking evidence of the definite character of the southern limit of the Leucochroic group up to this point. That many contradictory examples could be cited I do not for a moment deny or overlook. For instance, the jumping mice occupy North Africa and Arabia, and thence, passing through Persia and Afghanistan to the north of the Suliman range, find their way into our plateau. But I do not dispute the existence of practicable passes between Persia and the region drained by the Oxus, and only wish to maintain that the main passage, and the main stream of migration, both of man and beast, flowed through this pass, whether from the west or east, but more certainly from the east. That a road was also open from the Oxus valley into Persia and Afghanistan is indeed necessary to my theory; but it was, I believe, a road out of the usual track, and was followed only by detached tribes independently of the main exodus.

Of the purity of the Leucochroic group, as it at present exists, it is difficult to speak. The Aino, possibly, on the one hand, and the Scandinavian and German types of the European on the other, may be taken perhaps as examples of the group without much risk of error, though probably the Aino are to some extent crossed with the Mongols, and certainly some of the European and Western Asiatic nations show signs of an origin not purely Leucochroic.

Mesochroi.—The members of the remaining group are typically known as Mongols, but among them are also included the Eskimos and other inhabitants of the Arctic regions, and all the tribes and nations of North and South America. The true Mongol is specially distinguished from the true Negro by the globular or extremely brachycephalic form of the skull, but this character can by no means be claimed for the whole of the Mesochroic group. The Eskimos, for instance, whose Mongolian affinities are universally admitted, are decidedly dolichocephalic, the average of a large number of skulls giving a cephalic index of 73.35. Many of the American Indians are also dolichocephalic, and many again are brachycephalic, so that between them it is impossible to draw any hard and fast line, and we are forced to admit that this character, at least in the present state of our knowledge, fails to convey any information as to the affinities of the group.

Of the most typical development of the Mesochroic races in

Asia little need be said, as ethnologists are, I think, agreed upon the point. Undoubted Mongols occupy the whole extent of the eastern shores of Asia from Kamchatka to Siam, and thence stretch westward to the Bay of Bengal. Excepting the most eastern parts of Bengal, the Assam Hills, they are, however, nowhere to be met with in the Indian region. But to the north of the Himalayas, that is, to the north of the *Æthochroic* boundary, they occupy the whole of the central plateau which I have assumed to be the original seat of the *Leucochroic* group, and thence they spread over Western Asia, taking the route which has already been attributed to the *Leucochroi*. Thus they reach in historic time as far as Hungary in the west, while their influence is to be plainly traced to the south-west of the Hindu Kush, in the great tableland of Persia. In the east they occupy the southern islands of Japan, whence probably they have expelled the predecessors of the *Aino*. In this region the true Mongolian character of the various tribes and races of man is undisputed, and I need not therefore enter into any discussion of their affinities. Of the Malays, however, some doubt has been expressed, and they certainly present characters distinguishing them to a considerable extent from the other Mongols. Yet they belong, I think, essentially to the *Mesochroic* group. That they have been greatly modified by crossing is, I believe, the cause of the variation to be detected, for in the first place they have penetrated far to the south, where they were in immediate contact with the *Æthochroic* group, and secondly they have for centuries been influenced by the immigration of Hindus, Arabs, and Chinese, and these two causes must have left their mark deeply impressed, not alone upon their language, manners, and customs, but also upon their physical characters. Their closest affinity is, I believe, with the Mongol, but there are also subordinate affinities, which pertain rather to the domain of ethnology than of anthropology.

The general agreement of the races termed Mongolian in Asia is, I think, so completely acknowledged by ethnologists that I shall not further enter into the question. The only doubt seems to be as to the affinities of the natives of America, yet even this is gradually giving way to the belief in the unity of the Mongolian, Eskimo, and American types. Dr. Pickering¹ has stated, with regard to the two former races, that a personal inspection had satisfied him "that the Esquimaux are Mongolians, and that there is no distinct physical race of man in the Arctic regions," and Mr. Murray² has gathered together not a little evidence in support of the same view. As regards the American affinities

¹ Pickering (C.), "Boston Soc. Nat. Hist. Proc.," vol. ix (1863), p. 182.

² Murray (A.), "Geogr. Distrib. Mammals" (1866), pp. 56 *et seq.*

Mr. Murray says that the "Chinooks and other northern tribes nearest the Esquimaux cannot be distinguished from them; and the tribes next to *them* on the south again pass insensibly into the red-skinned tribes of middle North America. These pass into the digger tribes of California, which have in their turn many of the characteristics of the tribes of Central and South America, and all attempts to elevate the tribes of South American Indians into separate races have long since been abandoned." Indeed the similarity between the tribes of South America is remarkably shown by the statement of the late Mr. Darwin,¹ that some rude Fuegians who sailed on board the "*Beagle*" were mistaken by the Brazilians for Botacudos, though these tribes are separated by almost the whole extent of South America. Dr. Wilson² has entered very fully into the question of the American cranial type, but though he has demolished the theory entertained by Dr. Morton, the well-known author of the "*Crania Americana*," that one characteristic type of skull could be traced throughout all the races of America, he has unfortunately given us nothing to supply the place of Dr. Morton's generalisations. In a collection of ancient Peruvian skulls markedly dolichocephalic crania were found associated with markedly brachycephalic crania, and though Dr. Morton has endeavoured to account for this divergence of type by attributing the lengthened form of skull to artificial compression, yet the symmetry of the cranium in a vast number of cases renders this hypothesis altogether untenable.

In other characteristics we obtain considerable evidence of similarity of type between the Indians of America and the Mongols of Asia. Dr. Wilson examined specimens of hair obtained from the burial ground of the Hurons near Lake Simcoe, which "retained its black colour and coarse texture, unchanged alike by time and inhumation; and in this respect corresponds with the modern Indians of South America, and also of the Chinese and other true Mongols of Asia." Again, though amongst a group of brachycephalic Peruvian skulls, Dr. Wilson recognised two subdivisions, the one having the bones of the face small and delicate, while the other displayed "the characteristic Mongol maxillary development and prominent cheek-bones," yet the former type is exceptional even in the ancient graves, and seems to be entirely unknown in the modern Indians.

Even in cases which have been regarded by certain anthropologists as decisive, great doubt really exists as to the value of cranial characteristics in the American races, and Dr. Wilson affirms that impartial and competent judges might easily assign

¹ Darwin (C. R.), "*Descent of Man*," 2nd edition (1875), p. 197.

² Wilson (D.), "*Prehistoric Man*" (1862), vol. ii, pp. 199 *et seq.*

the skulls of Iroquois and other northern tribes to the Eskimo type, notwithstanding the alleged characteristic form of the Eskimo skull. He goes further even than this, however, maintaining that the "elements of contrast between the Hurons and Esquimaux are mainly traceable in the bones of the face, physiognomical, but not cerebral," while he expresses his own view upon the question by stating that an "examination of Arctic crania, and a comparison of them with those of the North American Indians in the Morton collection, has by no means tended to confirm" his "faith in the existence of any such uniform and strongly marked line of difference as Dr. Morton was led to assume from the small number of examples which came under his observation." Finally, Dr. Wilson sums up the evidence which he has brought forward on the subject of the American cranial type in the following words:—"It is indeed an important and highly suggestive fact, in the present stage of ethnological research, that authorities the most diverse in their general views and favourite theories as to the unity and multiplicity of human species, can nevertheless be quoted in confirmation of opinions which trace to one ethnic centre the Fin and Esquimaux, the Chinese, the European Turk and Magyar, and the American Indian." With this remark I shall leave the question of the physical resemblances of the Mesochroic group, concerning which there is such concurrence of testimony that any lengthened discussion seems unnecessary.

With reference to language, the evidence is also conclusive of the unity of origin of the Mongolian and American races. Of the Koriak in Eastern Asia Dr. Latham¹ has affirmed that it is "notably American." He regards, indeed, the whole group of languages spoken by the inhabitants of the Arctic region as "dialects of a single language—the Eskimo."² He says the "language of Greenland and Labrador is Eskimo. The language of the eastern extremity of Asia is Eskimo. The language of the Aleutian Islands is Eskimo. The language of the interjacent regions is Eskimo also." And further, he says that in "North America the connection with Asia is decided."³ In summing up the characters of the American languages Dr. Latham⁴ states that in "any South American vocabulary of adequate length, some North American root presents itself—some, indeed, from the extreme north, *e.g.*, the Eskimo area. Now as borrowing is out of the question (while the words are not of the sort to be excogitated by distant speakers), this, along with the phenomena of the transition, is the chief philological argument in favour of the fundamental unity of the two classes.

¹ Latham (R. G.), "Elements Comp. Philol." (1862), p. 176.

² *Ibid.*, p. 385.

³ *Ibid.*, p. 517.

⁴ *Ibid.*, p. 521.

That the transitions are obscure is, from the scantiness of our data for the most important points, what we expect, *a priori*."¹ Dr. Latham, in fact, considers the unity of the languages of North and South America to be so well established that he doubts whether the "ordinal value" of the whole class "is higher than that of the so-called Indo-European in its most restricted form."

The foregoing arguments, brief as they are, appear sufficient to justify our including in one group the races of the Old World known as Mongolian, the races of the New World generally spoken of collectively as American Indians, and the races, including the Eskimos, Lapps, Finns, and others, occupying the Arctic regions. Whatever may be their differences, these are not greater than are to be found in the other great groups; while the transition, both as regards physical structure and language, seems to be more gradual between one race and another than is the case with either the Leucochroi or Æthochroi.

It remains now only to suggest the possibility of yet another development of the Mesochroic group, and this is, I believe, to be found in the Bask. These inhabitants of the western shores of Europe have long been a puzzle to ethnologists, and the suggestions as to their affinities are without number. But I think that when the casual statements of many writers are put together the evidence is in favour of a Mesochroic origin. Carl Vogt² affirms, upon anatomical grounds, that the "Basques are, as yet, an unsolved problem; they cannot possibly have come from Asia." In a note are added some observations of M. Broca, upon the cranial development of the Basks. He claims to have proved that between the dolichocephaly of the Bask and of the Indo-Germanic races there is an essential difference, while between the Bask and the African Negro there are decided points of resemblance in this respect. He points out, however, that though this resemblance exists, other characters, such as the smallness of the upper jaw, by no means correspond in the Basks and Negroes, while, as regards the special form of dolichocephaly exhibited by the former, he states that it "belongs essentially to the American race." Other points of agreement between the Basks and the American races could be cited, tending to prove their physical affinity, did space permit, but I must be content with a single argument derived from language. Professor Whitney³ has remarked that the "Basque forms a suitable stepping-stone from which to enter the peculiar linguistic domain of the New World, since there is no other dialect

¹ Latham (R. G.), "Elements Comp. Philol." (1862), p. 521.

² Vogt (C.), "Lectures on Man," Engl. Transl. (1864), p. 381.

³ Whitney (W. D.), "Life and Growth of Languages" (1875), p. 259.

of the Old World which so much resembles in structure the American languages." Judging from his own standpoint, and consequently passing over in silence the observations of Broca and Carl Vogt, to which I have already referred, he concludes that the "Basques are a white, 'Caucasian' race; there is nothing in their other ethnological characteristics which should forbid our connecting them with any great division of the white race; but their speech at once cuts them off from every other, and we accept its decision as authoritative."

In considering the geographical distribution of the Mesochroic group, I confess I am at a loss for a starting-point. To place the original seat of the group in America would certainly remove many difficulties, with reference to the distribution of the Leucochroic group, but such a course would not, I think, be satisfactory in other respects. Probably the distribution of the extinct rhinoceros defines tolerably nearly the original distribution of the Mesochroic group in the Old World. The boundary of the region on the south stretches from the northern shores of the sea of Okhotsk to the Black Sea, and thence follows the shores of the Mediterranean to the Atlantic; while on the north the boundary was doubtless formed by the then existing sea, wherever that may have been. It is, however, to be observed that no remains of rhinoceros have hitherto been found in Norway, Sweden, Finland, Lapland, or Novaya Zembla, which we may therefore presume to have been then submerged beneath the waters of the Polar Sea. In this region I think the Mesochroic group once had its home, and hence I think it has been to some extent expelled by changes of physical geography, and consequently of climate, and at a comparatively late date by the incursion of martial races from the Leucochroic region of Asia. Thus I think we may account for the anomalous character of the human remains to be met with in many of the most ancient places of sepulture in Europe, and thus we may account for a remnant of a race with markedly American affinities in the extreme west of Europe. There exists one difficulty in the way of readily accepting this theory, however, which must at once occur to every ethnologist, namely, the truly American and not Eskimo affinity of the Bask and American languages. To explain this we are forced to revert to the old Atlantis theory, which has been so often proposed, rejected, and again proposed. Yet there is in fact no great geological difficulty in the way of accepting this proposal. Great as are the depths at some points in the Atlantic between North America and Europe, yet an elevation of 2,500 fathoms would unite the two continents. Moreover, the distribution of certain groups of mammals appears to me to favour the belief in the oft-derided Atlantis. We have seen the

extension of the rhinoceros, as represented by fossil species, in the Old World, and it is interesting to find it also in North America, the more so as its position to the east of the Rocky Mountains seems to point to migration between Europe and America, and not between Asia and America. I shall not attempt to explain the distribution of the existing rhinoceros, but some reference seems necessary to the fossil species found in India. The affinities of these seem to be entirely with the existing species of the Old World, and however they came to occupy their present position, we may, I think, admit that they existed independently of the northern species, from which probably they were severed long anterior to the distribution of mankind.

I have already referred to the distribution of the wolves as indicating what, in my opinion, has been the course of migration of man through Asia and Europe, and it is observable that these extend, with little specific variation, throughout North America, between the Tropic of Cancer and the Arctic circle; whether, however, the migration was between Europe and America or between Asia and America it would be impossible to decide. The wolves and foxes which collectively extend so universally throughout Asia and Europe, north of the *Æthochroic* boundary, also occupy the whole of North America, but there again it is impossible to determine the course of migration.

The fossil representatives of the horse point very clearly, as it seems to me, to a connection between Europe and North America. In the Old World the *Equidæ* extend eastwards, so far as we are at present aware, but little beyond the Caspian, occupying the Atlantic coast from Spain to the Baltic in the west. In North America they occur throughout the United States north of the Tropic of Cancer, and as they are distributed throughout South America they doubtless originally extended through the interjacent region. This seems to point indubitably to a connection between Europe and America, though perhaps to one of very early date. Other instances might be given, pointing in the same direction, though presenting anomalies which unquestionably require explanation.

NOVEMBER 10TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

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- Silex Tertiaires. Par M. Adrien Arcelin.
- Sur l'Interprétation de la Quantité dans l'Encéphale et dans le Cerveau en particulier. Par le Docteur L. Manouvrier.
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The election of H.H. PRINCE ROLAND BONAPARTE as an Honorary Member, and of Dr. A. ASHER, Dr. ALEXANDER BAIN, C. F. CLARKE, Esq., J. W. CROMBIE, Esq., M.A., T. H. EDWARDS, Esq., P. NORMAN, Esq., and EDWARD TREGEAR, Esq., as Ordinary Members, was announced.

The PRESIDENT, in opening the meeting, spoke as follows:—

OPENING REMARKS *by the President.*

THERE is little doubt and little cause for surprise that the appreciation of Anthropology is on the increase. Besides the gratifying facts that more new members are joining the Institute, and that the corresponding section of the British Association has become increasingly popular, there are other examples of a no less solid kind. For example, the authorities of Trinity College, Cambridge, have lately extended the tenure of one of their Fellowships for five years, to enable its holder, Mr. J. Frazer, to pursue his anthropological studies; and again, at the meeting of the British Association at Aberdeen it was the Rector of the University, Dr. Bain, who contributed one of the most thoughtful of the Anthropological Memoirs.¹ A notable instance of zeal for the science is now before the Council. It is a proposal by Mr. Featherman to bequeath to the Institute a sum now yielding £100 a year for the following object. Mr. Featherman has been continuously engaged for fifteen years in

¹ See page 380.

compiling the MS. of a large work, the "Social History of the Races of Mankind," of which only two volumes are actually published, and which, like the "Descriptive Sociology" of Mr. Herbert Spencer, contains a multitude of data concerning customs and institutions, methodically arranged. Such works are precious to investigators, but costly to print, as they cannot be expected to sell widely enough to pay expenses. Mr. Featherman devotes the annual sum above-mentioned to print a volume from time to time, and now desires to place the eventual publication of the whole series beyond the reach of the accident of his life. He proposes to make the bequest for the purpose of continuing the printing, leaving at the same time the copyright and stock of the work to the Institute, and providing for the subsequent application of the income to anthropological purposes, leaving considerable discretion to the Council as to how it should be applied.

The social history of alien peoples is full of problems. Thus it is a frequent observation that men may thrive and be happy under the most cruel governments, but the explanation of the several cases is imperfect. We have yet to learn how far it depends on hidden compensations, and how far on the genius of the people. The question of innate varieties in mind and instinct between different races requires more exact investigation than it has yet received. Anyhow, we have to get rid of the common illusion that the axioms of moral conduct, which are or appear to be natural to ourselves, must be those of every other sane and reasonable human being. The very existence of the Anthropological Institute should be construed into a standing protest against such narrowness of view. The world of human mind and instinct is richly variegated, persons even of the same sex and race differing sometimes more widely than ordinary men differ from ordinary women, though of course in other ways, and this amount of difference is indeed large. Foreigners say that we are stiff, and that our naturally narrow powers of sympathy are still further contracted by insular prejudices. Be this as it may, it is certain that the English do not excel in winning the hearts of other nations. They have to broaden their sympathies by the study of mankind as they are, and without prejudice. This is precisely what the Anthropologists of all nations aim at doing, and in consequence they continually succeed in discovering previously unsuspected connections between the present and past forms of society, between the mind of the child and of the man, and between the customs, creeds, and institutions of barbarians and of civilised peoples. Anthropology teaches us to sympathise with other races, and to regard them as kinsmen rather than aliens. In this aspect it

may be looked upon as a pursuit of no small political value. Many are now endeavouring to test mental differences with numerical precision. The possibility and importance of their investigations was strongly insisted upon by Dr. Bain in the Memoir referred to above, while another paper by Mr. Jacobs, which arrived too late to be read at the British Association, and will be published through another channel, contains noteworthy proposals on a method of conducting them. Both of the memoirs submitted to the meeting to-night belong to this branch of Anthropology. That by Mrs. Bryant gives the result of a first scientific attempt to test certain elementary characteristics in the disposition of school-children, and that by Mr. Jacobs endeavours to assign a numerical ratio to the intellectual ability of the Jews as compared to that of other races.

The following paper was then read by the writer:—

EXPERIMENTS *in* TESTING *the* CHARACTER *of* SCHOOL CHILDREN.
By Mrs. SOPHIE BRYANT, D.Sc. Lond.

EARLY in this year, at the suggestion of Mr. Francis Galton, I made some attempts to devise means for testing the mental characteristics of children. Long experience in teaching had made me aware of the fact that the manner in which a paper of written questions is answered sometimes reveals to an attentive observer quite as much about the character of the writer as about the extent and soundness of his or her knowledge. I was in the habit of making mental notes for practical purposes concerning my pupils' defects and excellences as so revealed; and I knew, as a matter of experience, the naturally-to-be-expected fact that a writer tells more tales about his own fundamental intellectual characteristics than a talker in close contact with another mind or other minds is likely to tell; at any rate, he tells different tales.

So I made my first attempt in the following manner. A number of children, all aged thirteen, were allowed to remain for about ten minutes in a room which they did not know, and were then required to write a description of it. I did not know the children personally at all, and I had no preconceived idea as to the character-points which I expected to be revealed. I read the papers, noting on them what I found in them; and when I went to the teachers who knew the children afterwards and gave the descriptions of character which I inferred, the agreement with

their general impressions was in all the marked cases somewhat striking.

The room described was, in this case, a schoolroom, having certain features in common with other schoolrooms familiar to the children, but having certain features peculiar to itself, and a sufficient amount of ornament in pictures and otherwise to redeem it from being quite prosaic. The manner, therefore, in which the description of it was given by the children is, I think, a fair test of their general character as observers so far as it goes. It must indeed be understood that the results of a *single* test may be accidental, and I think it ought also to be understood that much less importance should be attached to negative than to positive results.

The points which I noticed in this first set of observations were as follows:—

1. In the perception of an object a logical distinction is made between the sense-impression and the apprehension of it by the mind, as between the passive and active factors of perception. By the act of apprehension the impression is transformed into a perception, constituted such by consciousness of its position as a distinct part of the whole mental content. Apprehension is essentially the bringing of the new into relation with the old, and thus interpreting the new by means of the old.

Now I found in my young observers signs of great variety in the ratio of these two factors of perception to one another. So much was this the case that I found myself able, according to my own diagnosis, whatever that may be worth, to mark for the two factors separately. Impressions were sometimes numerous and faithful where the power of giving them a meaning, and thus perceiving them fully, was clearly very slight, or at least inoperative.¹ In such cases the perception was what would be ordinarily called unintelligent. Care must of course be taken, in deciding on these signs of feeble apprehension, to consider whether the ideas by which a meaning could be given to the impressions in question were ideas that could be fairly supposed present in the child's mind; there can, however, be little room for mistake where bare perceptions with the minimum of apprehension are numerous.

In other cases the impressions either made or at any rate dwelt upon were fewer, but the apprehension very complete. This completeness of apprehension occasionally passed the point of complete perception in most of the perceptions made, and distinct tendencies to pass from perception to pure inference shown. Sometimes the inference was correct, and that not by chance, since it had the marks of having been cautiously con-

¹ See paper I, Appendix.

ducted. Such little phrases as "I suppose," or "it is likely," are tell-tales here, as marking off the cautious from the reckless thinker. This latter person is betrayed also among my cases by a very unmistakable hastiness of inference, which in the bad cases degenerates into actual false perception. For instance, the name, C. W., in the corner of a picture is reported as M. W., this being the name of a girl in school, whom the young observer very well knew.

I found, as indeed might naturally be expected, that the false perceivers were nearly always ready apprehenders, who, as I suppose, digressing into actual inference, inferred carelessly, and projected their false inferences into false perceptions.¹ The carelessness of such inference is of a very simple character; the impressions to the test of which the inference should be brought are there, and it is not brought to the test. This argues absence of the impulse to criticise, which is the basis of accurate habits of thought. Feebleness of the impressions is, it must be admitted, a negative cause for the false perceptions, since the test is thus kept in the background; but it is only a negative cause, since if the critical impulse were really strong, the inference would be challenged at least, even if it could not be corrected. In judgments, however, as to character tests, it would be necessary to estimate this negative cause as otherwise indicated, and allow for it before deciding on the degree of the critical defect.

2. In the second place, differences were observed in the degree of orderliness with which perceptions are marshalled, and in the general notion of order which characterises any particular observer.

Out of twenty observers eight gave evidence of no noticeable interest in order at all; the objects appeared to have been observed haphazard, as far as their relation to one another logically, or in place, went. On the other hand, seven descriptions were as orderly as they could well be expected to be, while to three I gave half marks, and to one two-fifths. In most of the orderly descriptions the order chosen was that of place: the order of the inventory round the room, some starting from the door, some from the opposite point, and some from the clock in the middle. In one or two the order was logical, *i.e.*, the order of what may be called the idea of the room, as in one paper which begins, "The first thing that strikes you are the rows of desks and girls." In another set of papers describing a more ornamental kind of room I found signs of a third kind of order, sometimes very strong—the order, namely, of æsthetic effects, the order in

¹ See paper II, Appendix.

space, and in idea too, being subordinated to the order in feeling for the beautiful.¹

3. Great differences in colour interest were also observable, since some took pains to describe colours fully, while others took no notice of colour at all, or very little. In the same way, any marked interest in form was also shown; though in the experiments under consideration no call was made upon the form-interest so strong as to test defect by the absence of response.

4. One other characteristic, and a most important one, came out into strong relief in a few cases. This is the tendency to substitute feeling for thinking, to apprehend impressions as the minimum of idea with the maximum of emotion, which I will call for simplicity over-emotionalism. An over-emotional person perceives objects habitually as sources of feeling, and that is of course equivalent to not properly perceiving them at all. Now, when in the description of a room a child tells you that it is very beautiful, and there are lovely curtains, and the sweetest flowers, and pretty ornaments, I consider that an evident mark of over-emotionalism, and should, in the educational interest, recommend a wholesome diet of ideas accordingly.

The negative defect—for after all it is a defect—of under-emotionalism, is, like all negative defects, difficult to test; but the freedom from defect reveals itself every now and then in little touches that are very subtle.

The description of another room prettily furnished as an ordinary sitting-room brought out more markedly some of these latter points; but the only new point noticed was an occasional tendency to flights of interpretative imagination, which is after all but a development of the tendency to complete apprehension by combining old ideas for the explanation of the new. An abstract of the results obtained in both these observations is given on the accompanying table, p. 347. The exact numerical marks under each head cannot indeed be considered as at all reliable in the sense of assigning precise degrees of value, and on the whole I am inclined to think that verbal remarks would be more valuable.

In the next observation made, a picture was used as test. The same contrasts as before were to some extent brought out in the various descriptions of the picture; but there was occasion for another set of contrasts in this case, and these contrasts came out decidedly. To see a picture in the full sense is to understand its meaning, and in the interpretation of meaning there is abundant scope for the most varied play of imagination, whether checked by faithful observation or not. Just as the

¹ See paper III, Appendix.

perception of an object resolves itself into the two factors of impression and apprehension, so the observation of a complex of objects resolves itself into the two factors of perception and explanation by means of appropriate fetches of the constructive imagination. Now, in some children we found abundant and accurate perceptive detail, with something like the minimum of constructive explanation. In others the opposite extreme was manifest, explanation good, and details little dwelt upon or even described with imperfect accuracy. Between these extremes the two factors were combined in various ratios, including the ratio of equality characteristic of the well-balanced type of mind.

Again, we observed varieties in the nature of the imaginative play which suggested well-marked contrasts of general character. Sometimes the play of imagination was almost purely intellectual, strictly subordinated to the purpose of fetching ideas for the explanation of observations. This I call the logical or intellectual imagination. In other cases the fetch of imagination was not so much after ideas to construe with as after feelings to luxuriate in; the ideas are overpowered in a mass of vague associated emotion. This, if it can be called imagination at all, may be marked out as the emotional variety, and a touch of it is not, of course, out of place in describing an object like a picture which has distinct æsthetic bearings. But most striking of all were the examples of dramatic imagination, which were not rare; here the picture is lost in the story which it is interpreted as meant to tell; the picture becomes the occasion for a departure into story-land, instead of remaining, as in the first case, the main fact, solely for the explanation of which such departures are at all allowed, and by which they are limited.¹

Besides these marked cases there were doubtful cases, and balanced cases, and cases negative altogether. Sometimes, too, the play of imagination was markedly careless and uncontrolled by the inward critic, as compared with the good cases in which it showed itself sober and self-controlled.²

All the observations above described were conducted several months ago. Quite lately I have tried the picture test again, and with similar results.

It goes without saying that the sources of error in such observations as these are very numerous. Accidental variations in the subject of the observation from time to time may produce quite misleading responses to the tests used. This is the least serious difficulty, however, since it can be dealt with, like all other similar difficulties, by taking the mean of several observa-

¹ See papers IV and V, Appendix.

² See paper VI, Appendix.

tions, and noting at the same time the limits of variation as itself an important fact. More serious are the difficulties arising from the complex implication of mental quantities with one another, which makes it impossible to measure them separately as physical quantities are measured, or calculate them with any pretence to scientific accuracy. The observer may feel pretty sure that there is more of factor A and less of factor B in one complex mental fact of which he has evidence than in another, but his estimate must be, at the best, not only a very rough but a very fallible one. The facts observed are all complex facts, the evidence indirect evidence, and the observer, moreover, reads this evidence through the atmosphere of his own individuality. For the last-named reason it is clear that several observers are necessary, to ensure the maximum of practical trustworthiness in the results. The observers must, however, be agreed on their method of diagnosis; and here again difficulties suggest themselves, since the personal equation in this case affects the method of diagnosis as well as the diagnosis itself, though probably this difficulty might be overcome by full discussion with facts at hand.

All these difficulties notwithstanding, I am satisfied that results obtained by such tests as those described have a genuine practical value, if the observer be careful and not dogmatic, and above all avoid attaching an absolute value to them. Their practical value depends on the use that can be made of them in the education of the person observed, or in the selection of a suitable occupation for him. If a series of observations of this kind could throw any light on mental defects which can be remedied by education, or mental excellencies which can be specially utilised, this would be something gained.

I have made some attempts to apply definite tests to mental operations of a higher kind than those of observation; but though I find it quite possible sometimes to form distinct impressions as to excellence and defect in fundamental intellectual characteristics after a certain amount of intellectual traffic with the individual in ordinary school-work, the application of special single tests is apt to produce no appreciable result at all. With some—many, perhaps—one's knowledge of the true condition of mind is from first to last, after all pains taken, very slight, and at present I see no royal road to investigation of character in its more complex manifestations.

APPENDIX.

I.

Description of a Room.

There is a clock on the wall, given by the old pupils; it has some grass crossed on the top of it. On the same wall there are several pictures, two of Julius Cæsar, there is one of Nero, Augustine, and Titus, and *one of a man standing on the ground with another little figure holding on to his leg.* There is a large one about a place with walls broken and pieces of stone lying about; on the other wall there is a picture of some daffodils in a vase. On the mantelpiece there are some vases; below the mantelpiece there are *some squares of china, all joined together with a pattern on it, done in red.* There is some green cloth on the window-sill and *some rock on one of the window-sills*, and a plant on another. There is a green notice board by the door, and over that there is *a picture with likenesses in it of men and women dressed in foreign costumes.* The gas is hanging in the middle of the room. There are three windows and three ventilators on the opposite wall.

II.

Description of a Room.

Entering the above room, if you examined the right-hand side you would see the blackboard, and in the centre of it overhead you would see a picture of a vase of daffodils, painted by Miss C. M. W.; the daffodil is our school flower. Turning round you would see all along the wall pictures of different people who lived long ago—for instance, Augustus, Julius Cæsar, Titus, and a great many more. In the centre there is a large picture of Rome, and above it the clock presented by Mr. C. T. P. There are pictures of men who lived long ago on each side of it. Now on your left-hand side there are three windows, each of which have coverlets (green) on the sills; on the first there is a very large piece of white coral. On the centre window-sill there are two ginger pots, containing dried grasses. On the right-hand window there is a pot of riband ferns; all three windows have their sills covered in green. In the front there is a cupboard, and then comes the slate, then Mrs. B.'s table, which is raised on a platform. Next come the mantelpiece and stove. There are very pretty pink and white tiles between the mantle-board and the stove. The mantle-board has a green covering, and at each end there is a red pot of grasses, and in the centre an Oriental pot. Over this there is a

picture and a portrait of one of the Governors. After this comes the list; and, lastly, the notice board; over this there are some coloured pictures in a gilt frame, bound round with red plush; it is presented by Miss S. Mrs. B.'s room is very pretty, but I cannot remember anything more about it.

III.

Description of a Room.

We went to see Miss B.'s room to-day, which is on the ground floor. The first thing I noticed when I went in was a cabinet full of old china. On looking round I saw that the walls were hung with pictures. On one side of the fireplace was a bracket, holding some more china. The mantle-board was high, and above it was suspended a looking-glass, framed in black and gold. Ornaments were also placed on the mantle-board. A fire was burning brightly in the tiled hearth, and the sun was shining through the half-drawn Venetian blinds. A little table containing books was standing near one of the windows.

IV.

Description of a Picture.

This picture represents four dogs, two of which are brothers. It is at night, and they are awakened by the sound of a mouse. They all jump up, frightened, and just as the white puppy is about to get out of his kennel, he sees the mouse, springs upon it with his two front paws, while the other little dogs are waiting patiently to see the result. The white puppy shows the younger ones how, when they get older, to catch mice. The kennel is made of wood, with iron bars round it. It is very large, because all the puppies have to live in it. At the side of the kennel is a large broom.

It is called the "First Lesson."

V.

Description of a Picture.

A mother bird had been looking for apartments suitable for hatching her young, as her abode where she lived at the present time did not suit. She at last arrived at a place where, on the wall, were these words, "Apartments to let," written on a piece of paper, and, thinking this was the very thing, she deposited her articles of "furniture" on the ground, and collected the straw

together, and there left them to go and look for necessities. One bird after a little time came out of its shell and looked around till its eyes rested on the printing, which he could not at all make out, and seeing that he was alone, but for his unconscious brothers or sisters, he had nothing else to do but to remain where he was (as he could not fly) till his mother returned, which she did in a few minutes, much to the young one's surprise, for he did not know he had one.

VI.

Description of a Picture.

The picture shows a lot of egg-shells, out of which the little fluffy chickens are just beginning to come. It is in the night. They are in open air, and there is not much straw for them to lie on. The bits of shell are lying on the ground, and it is very cold for them, being so small. There is an empty house next to them with "Apartments to let" written on a board; and one of the little things is looking up at the house as if asking to be taken in and kept safe and warm till he grows larger and can take care of himself.

DESCRIPTION OF A ROOM.

FIRST SET OF OBSERVATIONS.					SECOND SET OF OBSERVATIONS.				
Impression.	Correct Apprehension.	Incorrect Apprehension.	Order.		Impression.	Correct Apprehension.	Order.	General.	Special.
A				A	1	.6	1	Observation very good	Colour not particularly noticed.
B	.8	..	1	B	1	1		Observation and intelligence very good.	Artistic feeling for colour.
C	.8	..	1	C	.7	.7	.7	Good paper.	
D	1	..	1	D	1	.6	.6		
E	.6	..	1	E	1	.7	.5	Observation good.	
F	.5	..	1	F	.7	.7	.2		
G	.6	..	1	G	1	.7	1	Observation and intelligence good.	
H	.8	..	1	H	.5	.5	.5	Emotional paper.	
I	.8	-.2	1	I	.7	.7	.6	Intelligence and observation good.	
J	1	-.5		J	.5	.6	.2	Observation good	Colour much noticed, but not always correctly.
K	1	..	.5	K	.5	.5	..	Emotion chiefly of a weak order, observation and intelligence fair.	
L	1	-1	.5	L	.6	.5	.7		
M	.5	-.5	.2	M	.5	.5			
N	1	..		N	.6	.5			
O	1	-.5		O	.6	.2			
P	.5	..		P	.5	.6			
Q	1	-.5		Q	.5	.6			Colour not noticed at all.
R	.5	..		R	.5	.5			Colour much noticed.
S	.5	-1		S	.3	.3			Colour not noticed at all, but rather form and size.
				T	.3	.5		Inaccurate.	

DESCRIPTION OF A PICTURE.

	Impression.		Correct Apprehension.		Incorrect Apprehension.		Emotional Tendencies.	Imagination.	Number.	Colour.
	Marks.	Remarks.	Marks.	Remarks.	Marks.	Remarks.				
A	5.5	.. ..	1	Very clever ..	.. ..	.. ..	.. ..	Very dramatic, over-balances observation altogether.	Not noticed...	Not noticed.
B	1	Very good and detailed.	1	Very intelligent, though without sense of humour.	.. ..	.. ..	Touch of emotion	Imagination, intellectual and dramatic; very well balanced.	.. ..	.. ..
C	8	Good ..	6	Active, but not intelligent.	.. ..	.. ..	.. ..	Fair and balanced..	Vague	Fair.
D	8	Good ..	5	Fair ..	.. ..	.. ..	.. ..	Play defective	Good	Fair.
E	5	.. ..	4	.. ..	.. ..	.. ..	.. ..	Slight ..	Vague	None.
F	1	Very good	5	Only fair ..	.. ..	.. ..	.. ..	No play ..	Good	Fair.
G	5	Fairly full, but careless.	1	Very intelligent	.. ..	.. ..	.. ..	Defective ..	Defective	Defective.
H	5	.. ..	4	.. ..	.. ..	.. ..	Slightly emotional	No play ..	None	None.
I	8	.. ..	5	.. ..	.. ..	.. ..	Feeling fair ..	No play ..	Good	None.
J	8	.. ..	4	.. ..	.. ..	.. ..	Feeling fair ..	Defective ..	Good	Good.
K	3	Poor ..	6	Active ..	.. ..	.. ..	.. ..	Defective ..	Vague	None.
L	4	.. ..	5	Fairly active, but careless.	.. ..	.. ..	.. ..	Defective ..	Fair	None.
M	1	Good ..	5	.. ..	.. ..	.. ..	Emotional play..	.. ..	Good	Fair.
N	5	Good in detail	5	.. ..	.. ..	.. ..	.. ..	No play ..	None.	.. ..
O	5	Good in detail	7	.. ..	.. ..	.. ..	.. ..	Imagination intellectual.	.. ..	.. ..

DESCRIPTION OF A PICTURE—continued.

	Impression.		Correct Apprehension.		Incorrect Apprehension.		Emotional Tendencies.	Imagination.	Number.	Colour.
	Mks.	Remarks.	Mks.	Remarks.	Mks.	Remarks.				
P	5	..	5	..	..	..	..	Imagination intellectual.	..	..
Q	4	..	4	..	..	..	..	No play ..	Inaccurate..	None.
R	4	..	5	..	..	..	Paper decidedly shows tendency to dissolve into emotion. Want of control in fancy.	Emotional and dramatic. Imagination not controlled	Vague ..	None.
S	8	Detailed	1	..	..	..	Play of emotion..	Intellectual, just enough for full perception.	None	Fair only.
T	8	..	5	Mechanical	..	..	Want of intellectual play on whole.	.. ..	..	Good.
U	4	..	1	..	..	..	..	Intellectual and dramatic play.	..	None.
V	2	..	5	..	5	False	..	Play rather meaningless.	Vague	Fair.
W	1	Observation very complete, balanced in detail, and intelligent.	1	..	..	..	..	Intellectual.	..	..
X	4	..	8	..	..	..	..	Intellectual and slightly dramatic.	Inaccurate..	None.
Y	5	..	5	..	..	..	..	Intelligent play ..	Inaccurate..	Fair.
Z	6	..	1	..	..	..	..	Emotional mainly..	None ..	None.
A1	8	..	4	..	..	..	..	Play defective ..	Inaccurate..	Fair.

DISCUSSION.

The PRESIDENT said that in new investigations of this kind it was the first step that was the most difficult to make. It was very satisfactory that this first step had been made by a person so singularly well qualified as Mrs. Bryant, who, as was well known, had gained one of those rarely earned and highly prized degrees of Doctor of Science at the London University, on the ground of her proficiency in mental science. Mrs. Bryant also had large experience in practical education. We could therefore be sure that a person who had the precise gifts needed to carrying on these investigations successfully would make sure advance. He was an optimist in respect to this inquiry, seeing that much had been really accomplished, and that we could hardly stand still, but must advance, and he did not see any boundary that certainly would limit that advance.

Mr. SULLY thought Mrs. Bryant's paper extremely suggestive. He had little to offer in the way of criticism, but would confine himself to throwing out one or two ideas that had occurred to him in listening to the paper. He was particularly struck with the way in which Mrs. Bryant had been able to distinguish between the two factors in observation, seeing what is directly present to the eye and interpreting what is seen. He thought her experiment might appropriately be followed by others specially designed to test each of these factors separately. Thus, the strictly visual capacity might be investigated by presenting objects having the minimum of suggestiveness, that is to say, perfectly definite but unerring forms, such as could be constructed by an arbitrary arrangement of lines. This would test the power of seeing finely, accurately, and rapidly. The other, or interpretative factor, would perhaps be best estimated by sketchy drawings of the human figure, landscape, and so forth, where just enough of concrete form is present to excite the imagination, and at the same time to offer unlimited scope for a varied constructive activity. Such an experiment would serve to bring to light the difference in children's power of taking sense hints, as they might be called, or of creating whole objects, or scenes, out of the scantiest data of sense impressions.

Mr. F. STORR welcomed Mrs. Bryant's paper as a sign that practical teachers were not only aware that psychology was an essential part of their training, but also beginning to co-operate with psychologists, and furnish them with observations on which to build. He criticised Mrs. Bryant's experiment as too ambitious, attempting, as it did, to test at once the powers of observation, retentiveness, and imagination. He referred to certain tests proposed by Mr. C. H. Lake, the first Secretary of the Education Society, by which it was attempted to determine quantitatively at any given time a child's *faculties*, as distinguished from knowledge and method, which are gauged by ordinary examinations. He called on Mr. Sully and other psychologists present to set school-

masters definite work of this kind, and promised, as a schoolmaster, to do the best to carry out their instructions.

Mr. CARVETH READ expressed his appreciation of Mrs. Bryant's paper, both for its general conception and the method of marking it out. He would only suggest that the scheme of such experiments might be extended by keeping a record of the mental characteristics of children at different ages, and especially of the same children year by year. We might then learn at what ages, on the average, different faculties of observation, imagination, reasoning, became conspicuous, and in what degrees and proportions, and so regulate education as to begin the training of these faculties severally at the most favourable times. It would also be interesting to know whether the same general mental character persisted from year to year, or changed; in what proportion of cases early mental promise was fulfilled; at what ages changes of mental balance were to be looked for. If the studies preferred by children excelling in certain faculties were recorded, we might perhaps infer that such studies were fitted to train those faculties.

The following paper was then read by the author:—

*The COMPARATIVE DISTRIBUTION of JEWISH ABILITY.*¹

By JOSEPH JACOBS, Esq., B.A.

[WITH PLATE XV.]

IN a previous communication to this Institute² I laid before it all the information I could collect as to the racial characteristics of modern Jews, their vital statistics, and bodily measurements. At the same time I expressed my belief that it would be possible to estimate with some degree of precision their intellectual ability as compared with that of other Europeans, and I promised to give this comparison on some future occasion. I shall endeavour to redeem that promise in the following pages. In doing so I find myself in face of two difficulties. The first was to discover a method of measuring ability. The heights of Jews can be calculated easily enough, their vital statistics need only to be collected from the bureaux of Europe. But who shall measure a man's mind so as to compare it with that of others? It was necessary to find some method that would give definite

¹ Parts of this paper were read before the Aberdeen Meeting of the British Association.

² "Journ. Anthropol. Inst.," August, 1885.

results and should have at the same time some claims to scientific accuracy and trustworthiness. Fortunately for me such a method has been before the world for the last sixteen years in Mr. Galton's "*Hereditary Genius*," and what I shall do in this investigation is only to apply to Jews the same line of argument that he applied to Englishmen in that well-known book. But having found my method, there still remains the second difficulty of explaining it in such a way that it will not be too wearisomely arithmetical. Roughly speaking, the method consists in finding how many eminent men of certain rank exist in each million of Englishmen and of Jews. To do this it is impossible to avoid numerical details, and I fear I must force the reader to pass some time in the uncongenial company of the Rule of Three. Luckily, however, the method likewise admits of being exhibited in a graphic form, and I hope to render it intelligible by means of a couple of diagrams, and by drawing upon the reader's imagination to make two tolerably simple suppositions.

The first is this. Suppose we ordered a tailor to cut out a piece of cloth under the conditions that it should be—(1) of fixed breadth; (2) contain a fixed area; (3) be symmetrical about a central axis; and (4) have no indentations in it. He would soon find that the first snip of the scissors would determine the shape of the cloth. For if (as in the dotted lines of fig. 1, Plate XV) he began to cut within the pattern curve he would have to bring the outline outside it, in order to make up the given area, and if he began outside it he would have to bring the apex within for the same reason. Bearing this sartorial experience in mind we may turn to our second stretch of imagination. I have said that our method consists in estimating the number of eminent men among a million Englishmen or Jews, as the case may be. Suppose that we had these million men collected together on Salisbury Plain, and suppose further that we were gifted with the insight of a recording angel and could arrange them in sixteen classes according to their ability, ranging from the greatest genius among them to the most degraded idiot. A long wall with fifteen projecting walls perpendicular to it would give us, as it were, sixteen pens, in which we could place our various classes. It is obvious that the central or mediocre classes would contain far more than the extremes: geniuses and, luckily too, idiots are far more rare than mediocrities. As a matter of fact, on the hypothesis here employed of the distribution of ability according to the law of deviation from the average, the two central classes would stretch out a broad mass of humanity nearly twice as long as the base line. If now we built a wall round our million men thus classified this would describe a curve

resembling in shape a section of a penny trumpet.¹ But this curve is of the same kind as we previously requested our tailor to cut out for us; it is of fixed breadth, symmetrical round the central axis, of fixed area, that filled by a million men, and it has no indentations, for there cannot be a larger number of men in a class more remote from mediocrity than in one nearer. But if this is so, we know from our former supposition that after a small portion of the boundary wall at the extremity had been built the shape of the remainder would be determined, so that all that would be necessary would be to find the number of men forming the first three or four classes and build the wall enclosing them. Mr. Galton built that wall for Englishmen, if I may say so, in his book "*Hereditary Genius*," and I have endeavoured to do the same for Jews and incidentally for Scotchmen, with results roughly indicated in fig. 2. This has been drawn out of scale at the extremities for the sake of clearness, and only gives approximately the true shape of the curve of distribution of ability on Mr. Galton's hypothesis, that talent is distributed round an average mediocrity like shots are distributed round the bull's-eye of a target ("*Hereditary Genius*," pp. 30-34).² With this explanation I turn to the calculations, which enable us, however roughly, to estimate the comparative distribution of ability among Englishmen, Scotchmen, and Jews.

But first we must recall the estimate by which Mr. Galton was enabled to determine the distribution of English ability. As will be remembered, he estimated that of every million Englishmen over fifty, 425 obtained sufficient reputation to earn them a place in Cooper's "*Men of the Time*," and of these 425 there would be 250 of equal or superior ability to that of an English judge. Assuming then that the exponential law of error applied to the distribution of talent he was enabled to subdivide these 250 into three classes, equally removed from one another. The first class (termed Class X) was composed of only one individual, whose prominence may be conceived from the fact that only 9 of this class are living at one time in the United Kingdom, only 2 among Englishmen over fifty. The next class, G, would include 14 members in each million, or 111 of all ages in the British Isles, while the third class, F, would average 233 per million; so that these islands would have 1,863 individuals of this class, but only 468 over fifty, before which age, as a rule, men do not obtain fame. These results, while enabling us to render more

¹ The well-known exponential curve ($y = \frac{A}{e^{kx^2}}$) which expresses geometrically the law of deviation from the average. Cf. Quetelet, "*Letters on Probabilities*;" Venn, "*Logic of Chance*."

² For explanation of Plate see p. 378.

precise what we mean by the terms "genius," "talent," and the like, may also be utilised to compare the abilities of different nations or races, and I propose to ascertain how many X's, G's, and F's, illustrious, eminent, and distinguished men, there have been per million among those Jews who have reached the age of fifty between 1785 and 1885, and by this means to obtain an estimate of Jewish ability as compared with British. It is right to mention that Mr. Galton is nowadays of opinion that we cannot rely upon the absolute accuracy of his results, owing to the variations at the end of a scale ranged according to the law of error.¹ But while this affects the absolute accuracy of his results it need not render a comparative estimate altogether valueless. If I take a metre rod in my hand, thinking it to be a yard measure, all the measurements I take will be too short by an inch in every foot. But if I wish to know whether one log is twice as long as another my metre rod will serve me as well for this purpose as if I were using the bronze bar that gives the standard yard for all England.

We have first to ascertain how many Jews have reached fifty in the century just past. Two methods suggest themselves. Taking the Jewish population of Europe at intervals of a generation in the years 1880, 1850, 1820, and 1790, it can be estimated that a little over 16,000,000 were living at these various epochs. One-fifteenth of these, or 1,040,000, would be males over fifty, and about half that number would have reached fifty and died in the interval. Or we may calculate the Jewish births between 1735 and 1835 at about 6,400,000, and of these nine-twentieths, 3,160,000, would reach the age of fifty, or almost exactly a million and a half males.² The concurrence of the two methods gives us some confidence in saying that, in the past century a million and a half Jews have reached the age of fifty. If Jewish intellect is equal to the English standard, we should expect to find in dictionaries of biography 1 illustrious Jew, 21 eminent ones, and 350 distinguished men of Jewish blood.

How many can we find? For the purpose of this comparison we must keep rigidly to names which have been considered worthy of insertion by the compilers of biographical dictionaries.

¹ The precariousness of the method consists in—(1) the doubt whether the base is fixed in length and so the classes equally removed: this, however, does not affect the comparison so long as it is kept to one standard; (2) doubt as to the symmetry of the curve: on this some evidence will be offered later on; (3) difficulty of trusting results at the end of a curve where accidental causes tend to disturb the law-abiding quality. Against the last may be urged that such inequalities are apt to disappear when such large numbers as a million are concerned. Appendix II offers an empirical justification for the method.

² It was estimated that the Jewish population in 1735 was 1,300,000, and in 1835 3,500,000. The geometric mean of these was taken as approximately 2,000,000, and a birth-rate of .32 reckoned on this for 100 years.

As Jews live all over Europe it would not be fair to confine ourselves to "Men of the Time," and I have accordingly searched Vapereau for France, De Gubernatis for Italy, and Bornmüller for Germany, though the latter two contain only literary celebrities. For persons distinguished in other careers, and for those Jews who died before dictionaries of contemporary biography came into vogue, I have consulted other compilations of about the same standing. There must be many omissions in looking through such extended lists where the creed is generally not mentioned, but I have, notwithstanding, succeeded in collecting from them 335 names of Jews distinguished in all branches of human activity (see Appendix I).

Not all of these 335 deserve to rank as distinguished in the more technical and restricted sense of the term as used in Mr. Galton's investigations. Of the 425 who in each million of Englishmen obtained a place in the dictionaries, 175, or 41 per cent., were deemed by him unworthy of distinction. I have been even more rigorous with the 335 Jews, and have rejected 50 per cent., leaving only 169 distinguished. Now comes the ticklish task of "placing" these, as it were, in a tripos of all the talents. I think, however, few will quarrel with me if I venture to place in the first rank these four illustrious names:—

BENJAMIN DISRAELI, LORD BEACONSFIELD.

HEINRICH HEINE, the greatest German poet since Goethe, "the wittiest Frenchman since Voltaire," the most potent of the warriors in the intellectual War of Liberation which has freed European thought from its mediæval shackles.

FERDINAND LASSALLE,

"whose genius was such

We scarcely can praise it or blame it too much,"

who, armed with all the culture of his time, became the darling leader of the German working classes, and is still remembered by them as "Messiah Lassalle," who was a jurist and an economist of high rank, an orator of great power, a philosopher and a poet, and who made Socialism a force in European politics. Prince Bismarck has confessed that he learned his Socialism from Lassalle, and it was universally recognised that these two were the most influential men in Germany in 1863, the year in which Lassalle met his death in an ignoble duel at the early age of thirty-eight.¹

FELIX BARTHOLDY-MENDELSSOHN, one of the great musicians

¹ Strictly speaking, Lassalle should not be counted, as he did not reach the age of fifty. But I draw no conclusion from the first class alone, and it is not of much consequence whether we reckon the first two classes as 28 or 29, especially when we have to double them to make them applicable to Western Jews.

of the world, who would deserve this place if only for having re-introduced Bach to us. I might perhaps have included his grandfather, Moses Mendelssohn, as the centenary of his death only occurs in 1886, but I should hesitate to class him as illustrious, and the difficulty of decision is luckily removed by the fact that his birth took place in 1729, six years before the limit of our inquiry.

Here, then, in the first class of intellect, where Jews ought to have been satisfied with one-and-a-half illustrious names, we find no less than four. In the second class, the "senior optimes" of our tripos, I place the following twenty-five:—Berthold Auerbach, Germany's greatest novelist; Theodor Benfey, the greatest philologist in Germany, the home of philology; L. Börne, second only to Heine in the struggle for Freethought; Cremieux, to whom the French nation recently decreed the honour of a national funeral; E. Gans, the leader of the German school of law and history; A. Geiger, the head of the Jewish Reform movement; H. Graetz, the Jewish Macaulay, though I class him a rank lower than his English prototype; L. Halévy, the musician; Sir W. Herschell, the astronomer; Jacobi, the mathematician, after whom the abstruse functions "Jacobians" receive their name; Sir George Jessel, late Master of the Rolls; Eduard Lasker, leader of the German National Liberal Party; Solomon Maimon, whom Mr. S. Hodgson declares to be the greatest German metaphysician since Kant (possibly because Maimon anticipated his own position): he was certainly a philosophical critic of the first rank; Karl Marx, the literary founder of Socialism and "headcentre" of the *International*; Meyerbeer, the musician; Neander, the Christian theologian; Jules Oppert, the greatest living assyriologist after Rawlinson; Sir Francis Cohen Palgrave,¹ the earliest of our scientific historians of England; Rachel, the greatest actress of all time; Ricardo, second only to Adam Smith in his influence on political economy; Jules Simon, the French politician; Steinthal and Lazarus, the twin leaders of modern philosophical philology; Professor Sylvester, co-founder with Professor Cayley of the modern higher algebra; and two Jewish scholars, M. Steinschneider and Leopold Zunz, whose names are less known because they have given up to Judaism what was meant for mankind, but whose erudition is, I am confident, sufficient to place them in the high rank which is here assigned them.² Here, then, in the second class, where we should expect

¹ I should not have reckoned Palgrave, but that Mr. Galton has himself marked him in black type (of G class). "Hereditary Genius."

² Many of these names will be unfamiliar to the reader. But if he reflects how unfamiliar the name of Sir G. Jessel, undoubtedly a second class man, would sound in Germany or France, he will perhaps understand that it is

14 eminent Jews to a million, we find as many as 25 to a million and a half, or 17 per million. In the first two classes, then, we have 29 illustrious and eminent names among a million and a half Jews, where we could only expect 22 or 23 of equal calibre among the same number of Englishmen, so that it might seem that Jews have a quarter more great ones of intellect than Englishmen.

But this flattering conclusion is rudely shattered when we turn to the third class of intellect, where Englishmen show 233 names to 99 Jewish celebrities per million. True I have rejected some 30 more names from this class than Mr. Galton would have done. True that these are just the names which would escape notice in a search through biographical dictionaries. But making all allowance for these sources of omission we could scarcely hope to bring up the number of distinguished Jews to that of distinguished Englishmen, whereas if the conclusion we drew from our comparison of the first two classes were correct we should expect many more also in the class of F's. There seems a discontinuity in the Jewish curve, indicated by the sudden drop in the dotted curve in Class F, which casts doubt on our whole method, and certainly traverses directly the favourable conclusion we were first inclined to draw in favour of Jewish ability. The explanation, however, is tolerably obvious. Hitherto we have assumed that our million Englishmen and our million Jews started on equal terms in the race for fame, but we know of course that this is only true for the third of European Jews who dwell in the West of Europe. The two-thirds of Jews who dwell in Russia and Roumania are heavily handicapped, as were indeed the remainder up to very few years ago. If Russia contributed her proper proportion to the 335 Jews on my list, there would be 200 Russian Jews upon it. Instead of that, there are only eight, four of whom have left their stepmother-country and sought a career out of Russia, and of the remaining four, two had to forswear their faith before gaining a reputation, and of the other two, one, Anton Rubinstein, has gained the world's ear by the cosmopolitan art of music, and the other is of fourth class rank in the Jewish speciality of Hebrew. If Russia had not

possible for some of the German and French celebrities mentioned in the list to be Jessels. For some of them I have the authority of Mr. Galton's book for putting them in the second class, and for the most obscure I could quote parallel (apparent) obscurities from "*Hereditary Genius*," e.g., Grynæus, Cassini, Mieris, Dussek, Porta, Celsius, who are all rightly enough put in the second class. If it is not exactly true that the world knows nothing of its greatest men, it is certain that it knows nothing of the second class men who prepare the way for the greatest. These remarks apply with still greater force to the list contained in Appendix I, and I have therefore been most rigorous in confining it to the names of those who have been selected by experts in celebrity to be included in the dictionaries of biography.

persecuted her Hebrews, and if Russian Jews are of equal calibre to the rest of their brethren, she might have reckoned on 8 men of the rank of Beaconsfield or Heine, 44 of the capacity of Sir George Jessel or Professor Sylvester, and 278 of ability equal to that of an English judge. Thus we seem to have been unfair in assuming that a million and a half Jews have lived to fifty in the past century: only a little more than half a million can be said to have lived, the rest have but existed and have been out of the running in the race for fame. If we take this into consideration, and compare Englishmen with Western Jews only, the first two classes show nearly three times as many as the same number of Englishmen, and the third class, which seemed so poverty-stricken, shows a quarter more names than half a million Englishmen could show. Even here there is discrepancy, and we still have to account for comparative paucity in the third class. Now this is just the class which is likely to be kept down by moderate persecution such as there has been in Western Europe. It would take Russian rigour to repress a Lassalle or a Beaconsfield, a Cremieux or a Lasker. But much less pressure would be sufficient to bar a would-be *savant* from becoming a Professor or perhaps a *savant* at all. And looking through our list we find plenty of evidence of the effects of such persecution. It must have been observed that three out of our four illustrious ones were only Jews by race, not by creed, and of our 22 G's nine have been baptised, and in all, 37 of our list have become Christians, more than one-tenth. Without prying into motives it is notorious, in cases like those of Beaconsfield, Heine, Börne, Gans, Ricardo, that conversion was adopted as the only means of obtaining the *carrière ouverte*. Of the 37 we find 28 born before 1810 and living their life before the year of freedom 1848, whereas of our list 114 only were born before 1810, 213 afterwards. The converts thus formed a quarter of those flourishing before 1848, and only a twenty-fifth of those afterwards. Similarly in Austria during the days when persecution equal to that of Russia prevailed we have only 5 celebrities born before 1810, no less than four of whom gained fame elsewhere, against 27 born in 1810–50. Another sign of persecution is the migratory habits of able Jews, for, as Mr. Galton has remarked, when a career is open to them able men are the last to leave their country. The Heine family form a typical group. The poet is buried in Père la Chaise; one of his brothers became Ritter von Geldern at Vienna, another was Court Physician at St. Petersburg; his sister married and became Princess della Rocca in Italy; while old Solomon Heine, their uncle, was the only one who remained faithful both to his creed and his country. In all 67 of my list, exactly one-fifth found fame in countries other than that of their birth, England

gaining as many as 30, and France 24 men of ability as a reward for their liberality. We could almost test the amount of persecution by the percentage of each country's loss, Russia coming first with 50 per cent., then Austria with 37, Germany 30, Italy 12, France 2, while England has not lost a single able Jew, but has gained as many as she herself produced.¹ With this evidence of persecution even in Western Europe we can explain the paucity of third class Jews, and may conjecture that but for this we should have nearly as many more third class as we have in the first two, who include a treble share. On the whole, then, with these corrections we may say that there is about twice as much chance of finding a distinguished man among Western Jews as among Englishmen.

Thinking that it would be desirable to apply the same method to another race, I have selected Scotchmen as a likely test of the validity of our method. I went through Irving's "Book of Eminent Scotchmen," and selected out of the 3,000 names those who seemed to me to have reached first and second rank during the past century. I also estimated the number of Scotchmen who reached fifty years in that period, and found this to be 960,000, or almost exactly a million. If their ability were the same as Englishmen, they should have one first class and fourteen second class. Instead of this I calculate that four Scotchmen—Carlyle, Gladstone, Macaulay,² and Scott—had reached first class rank (we might say $4\frac{1}{2}$ if we reckon Byron, who was Scotch on his mother's side), and 20 G's—Sir C. Bell, Sir D. Brewster, Lord Brougham, Burns, Lord Campbell, Erskine, David Forbes, General Gordon, Sir W. Hamilton, Sir James Ivory, Lord Jeffrey, D. Livingstone, Sir Chas. Lyell, J. Clark Maxwell, James Mill, J. S. Mill, H. A. J. Munro, Sir C. Napier, Sir W. Thomson, James Watt. This would give Scotchmen a

1	Born.	Per cent.	Emigrated.	Immigrated.	Lived.	Per cent.	Per cent. Jewish Population.
Austria ..	32	12	12	4	24	9	14
England ..	30	11	0	30	60	21	6
France ..	53	19	1	24	75	27	8
Germany ..	128	47	46	5	87	30	7
Italy ..	24	9	3	2	23	9	5
Russia..	8	2	4	1	4	1	60
United States..	6	2	1	2	6	2	7

From this it would seem that England, France, and Italy have produced the largest number of Jewish celebrities in proportion to their numbers.

² I reckon Macaulay first class not only on account of his literary productions, though these are too much underrated nowadays, but because of his proved abilities as administrator, orator, and conversationalist.

position superior to that of Jews in general, including those of Russia, but intermediate between Englishmen and Jews of Western Europe.

This result may be checked by an application of our method, which leads to the most startling and curious results of our investigation. In assuming our curve of the distribution of ability to be symmetrical, we have opened the way to estimating the excess of ability by calculating its deficit. There should be as many in each class below the average as above. Now in several special instances this is true for Jews. The curve serves to distribute musical or linguistic ability as well as general ability. If Jews have, as we shall see they have, more musicians and philologists at the top of the scale, they should have more deaf-mutes at the lower end of it; we know they have. And the method cuts both ways. Jews are justly proud of having less criminals than their neighbours. But that would imply that they have less moral enthusiasts at the top of the moral scale, and more proportionally of average morality, or in other words more worldly persons: that does not seem opposed to facts.¹ So too, turning again to general ability, if Englishmen, Scotchmen, and Jews are in this order as regards intellect, they should retain the same order as regards want of intellect. This is so, for while Englishmen have 3,050 per million afflicted with mental disease, Scotchmen have 3,400, and Jews 3,900.² The same numbers ought to give the proportion of eminent men of the first four classes, X-D, among the three races. This result of our method was a surprise to myself, and I was deterred from using it by finding that the United States has the smallest proportion of lunatics among civilised states. But instead of disproving our position we have here a remarkable confirmation of it. For the United States have not produced a single man of the first class, except Washington and perhaps Emerson, in the last century. A further confirmation of this curious fact is to be seen in the parallelism of high ability and high lunacy rate in the Protestant states of Europe as compared with the Catholic.³

¹ Other illustrations may be adduced, which seem to bear out this law in the case of Jews as compared with others. Thus they have the reputation of being both more charitable and more mean than their neighbours; of having more superstitious persons and more sceptics; they certainly have both more rich and more poor. Thus their curves of altruism, of faith and of acquisitiveness, seem to conform to the law.

² I take the lunacy rate of England and Scotland from Oettingen, "Moral-statistik," Anhang Tafel XCIV; that of Jews from those of Prussia in "Zeits. Preuss. Stat.," 1882, p. 190. These numbers rather exceed those contained in the four extreme classes, as is indicated in fig. 2, by placing the boundary line within the fifth class from the bottom.

³ It might seem that all progress is impossible if any increase at the top of the scale is counterbalanced by a deficit on the other hand. But true progress

This is not the only piece of instruction we receive from the comparative lunacy rate of the three races we are comparing. The figures themselves have enabled me to interpolate the numbers in the various classes, and to ascertain with some degree of accuracy the number of men of only average ability among them, as in the table attached to Plate XV. There are, according to Mr. Galton, 256,000 of the mediocre class A among a million Englishmen; I reckon by a process of interpolation that there are only 239,000 among Scotchmen, and 222,000 among Jews. It follows that reckoning from the bottom of the scale the 722,000th Jew is equal in ability to the 739,000th Scotchman and the 756,000th Englishman. Or in other words, if we took a hundred men at hazard from each of the three races, the 72nd Jew, reckoned from the least able, would equal in ability the 74th Scotchman or the 76th Englishman, and would be superior in ability to the 72nd of either of the other two races¹ (fig. 3). Thus we arrive at last at a real comparative estimate of Jewish ability, which we may state roughly in the following way. The average Jew has 4 per cent. more ability than the average Englishman, and 2 per cent. more than the average Scotchman. I do not lay very much stress on the accuracy of this result; a Scotch investigator on the same method would probably invert the order. But I feel some confidence in the method, and consider that by its means we may one day be enabled to judge the relative ability of various nations and races. (See Appendix II.)

However satisfactory this result may be to all concerned, we cannot close the inquiry before ascertaining the comparative distribution of Jewish ability among the different branches of human activity. If Jews got into the reference books only for acting, or for chess-playing, or for proficiency in Hebrew, we could not draw any such conclusions as that just mentioned. We must see in what branches Jews show most ability: we must examine their quality as well as their quantity. But before doing so we may gather up a few collateral results of interest. We have already mentioned and explained the large number of baptised Jews in the list. Equally striking is the comparatively large number of Jewesses, no less than thirteen, figuring there as actresses, writers, or leaders of *salons*. At the beginning of this century almost all the chief *salons* of Berlin were presided over by Jewesses—*e.g.*, Dorothea Mendelssohn-

consists in raising the average, elevating Class A into Class B, from which more at the top of the scale and less at the bottom follow inevitably. We must "shift the origin," as the mathematicians say.

¹ This is an application of Mr. Galton's method of percentiles explained in "Journ. Anthropol. Inst.," vol. xiv.

Schlegel, Rahel van Ense, Henriette Herz. The best known English *salon* of recent date was also attracted round a Jewess, Countess Waldegrave. For their numbers, too, the Sephardic or Spanish Jews make a goodly show with twelve celebrities instead of three, which would be a proper proportion: to them belong the two Disraelis, Basevi the architect of the Fitzwilliam Museum, Cambridge, Sir Moses Montefiore, and David Ricardo. But most striking of all is the large number of men of half-Jewish blood.¹ I have included twenty of these in the list, though all but two, Franzos and Salvador, were brought up as Christians, but they have come under Jewish influence both by heredity and from their relations. It may be of interest to enumerate them: Edwin Booth the actor, H. J. Byron, of "Our Boys" celebrity, F. Delitzsch, G. Ebers, the Egyptologist and novelist, Ludovic Halévy, Paul Heyse, Sir John Herschell, Paul Lindau and his brother, Bernal Osborne, Francis Turner Palgrave the critic, W. Gifford Palgrave the traveller, Prevost-Paradol, Jules Simon, Sir Arthur Sullivan, and Sir H. Drummond Wolff. Altogether 5 per cent. of the whole, and yet mixed marriages are not anything like so numerous as that, and as most of my examples are English I have probably missed a large number abroad. I have not included remoter descent, as we can scarcely term them Jews in any sense of the word. Besides, I could only find five examples, of whom the eminent Sir John Millais is one, though where his Jewish blood came in I am unable to ascertain. The paucity of later generations of Jewish intermixture may be due to difficulties in tracing them, or, as I am inclined to suspect, to the infertility of mixed marriages.

Leaving these subsidiary results, let us turn to the *distribution* of Jewish talent. Here, fortunately, I am still able to compare with Mr. Galton's results, as he gave in his book (p. 8 n) a rough analysis of the specialities of the men of the time in Europe generally, and not alone in England. Reducing these to "per-millages" (proportion per thousand celebrities), and doing the same with my own results, I obtain the following table:—

¹ Mr. Grant Allen has already made the same observation. "The list that can be compiled of distinguished persons of half-Jewish blood is something simply extraordinary, especially when one remembers the comparatively small sum-total of such intermarriages" ("Mind," vol. viii, p. 504-5).

		Europeans.		Jews.	
		Europeans.		Jews.	
Actors ..	..	21	34	Miscellaneous ..	4 3
Agriculture ..	..	2	..	Metaphysics ..	2 18
Antiquaries ..	..	23	26	Musicians ..	11 71
Architects ..	..	6	6	Natural Science ..	22 25
Artists ..	..	40	34	Naval ..	12 ..
Authors ..	..	316	223	Philologists ..	13 123
Divines ..	..	130	105	[Poets* ..	20 36]
Engineers ..	..	13	9	Political Economy	20 26
Engravers ..	..	3	..	Science ..	51 52
Lawyers ..	..	44	40	Sculptors ..	10 12
Medicals ..	..	31	49	Sovereigns ..	21 ..
Merchants ..	..	12	43	Statesmen ..	125 83
Military ..	..	56	6	Travellers ..	25 12

* Already included in Authors.

We cannot assume from this list that all cases where Jews have a higher "permillage" they produce more experts per million in that branch; it merely implies that of those who do obtain distinction a larger proportion obtain it in the particular study. In short, the table gives a comparative estimate of English, or rather European, and Jewish *interest* in particular studies, and thus only indirectly of their respective capacity. With this proviso we may sum up as follows. Jews have no distinction whatever as agriculturists, engravers, sailors, and sovereigns. They are less distinguished than Europeans generally as authors, divines, engineers, soldiers, statesmen, travellers. The two lists are approximately equal in antiquaries, architects, artists, lawyers, natural science, political economy, science, sculptors. Jews seem to have superiority as actors, chess-players, doctors, merchants (chiefly financiers), in metaphysics, music, poetry, and philology. On the whole, these results correspond with the rough inductions of common experience. I should, however, have expected a much larger contingent of lawyers and political economists among Jews than among *les autres*, and I am surprised to find Art so equally represented. I have only one artist on my list who reaches even third class rank, Josef Israels, for of course I do not reckon Sir John Millais on the strength of a few Jewish corpuscles in his veins. Most persons will be equally surprised to observe equality in science, both in what Mr. Galton calls natural science and in science pure and simple, chiefly mathematical. As regards the former, of course Jews have no Darwin. It took England 180 years after Newton before she could produce a Darwin, and as Britishers are five times the number of Jews, even including those of Russia, it would take on the same showing 900 years before they produce.

another Spinoza, or, even supposing the double superiority to be true, 450 years would be needed. But in the lower ranks even of biology Jews have done and are doing good work. Bernstein, Cohn, Remak, Rosenthal, and Valentin as physiologists, Cohnheim, Hirsch, Liebreich, Lombroso, and Traube as pathologists, will be recognised by specialists, while F. Cohn is perhaps the third greatest botanist in Germany. But Jews show to more advantage in abstract science, mathematics and astronomy. The history of pure mathematics during this century would show large blanks if the names of Jacobi, Sylvester, Kronecker, and Cremona were removed. In astronomy we have the cluster of the Herschells, the name of Goldschmidt, who discovered fourteen asteroids in the "fifties" and "sixties" when such discoveries were not an everyday occurrence, and W. Meyerbeer, brother of the musician and author of the first great chart of the Moon. Altogether, then, I conclude that Jews take their full share in the scientific work of the day. This result of the table, however, was so contrary to my expectations that I have attempted to check it by other estimates. In Sir John Lubbock's Jubilee speech at York I find eight Jewish names out of the 289 who are mentioned as contributing to the last fifty years of science: this is considerably above their proper proportion, even when including the Russian Jews. Again, in M. de Candolle's book, "*Histoire de Science*," I find 10 Jews holding 16 out of the 824 chairs as foreign members of the scientific academies, which he uses as a test of scientific ability. This is just the right proportion, the Jews of Europe being 7 out of 333 million.

Less surprise will be felt at the subjects in which Jews seem to show superiority. In acting that is better recognised on the Continent than here, and the same may be said of medicine: in Austria one may say *Ubi tres medici duo Judæi*. The Jewish merchants who get into the dictionaries are of course the great financiers. But it is chiefly in music and philology that Jewish superiority is most marked—music sixfold, and in philology there seems to be nine times as much Jewish talent as European. For the former, besides the great names of Mendelssohn, Halévy, Meyerbeer, Rubinstein, already mentioned, we have many lesser lights like Sir Julius Benedict, Sir M. Costa, F. Cowen, Joachim, Pauline Lucca, Moscheles, Sir A. Sullivan. English music, to say the least, would be almost non-existent without these Jewish names. Even more striking is the number of Jewish names distinguished in philology. These are not alone connected with Oriental and Semitic philology like Benfey and Oppert, but they count a goodly number of classical scholars, Bernays, Bernhardt, Lehrs, Friedländer, H. Weil, to whom we may add Freund, the author of the Latin Dictionary, which is the basis

of all those used in England. The names of Lazarus and Steinthal are known wherever the principles of philology are studied. In modern languages, too, Jews have done good work. Sanders has done for German what Littré did for French, and a Jew, the well-known Ollendorf, may claim to have taught languages to the largest number of people by the clumsiest method of teaching.

If we may venture to inquire into the causes of the Jewish superiority established on these somewhat hypothetical grounds, there are various reasons which can be given. We have to take account of their residence in cities, always more conducive to the life intellectual. From this, too, follows their addition to commerce as distinguished from industry, and as the former implies head work, and the latter handicraft, mental capacity must be aided by this fact. The care Jews give to their children's education is well known, and must help. All Jewish boys have hitherto had to learn Hebrew, as well as the vernacular, and this must further mental progress. Dissenters generally seem more intellectual because they have early to think out their differences from the generality. In the case of Jews, persecution, when not too severe, has probably aided in bringing out their best powers: to a high-spirited race, persecution, when there is hope of overcoming it, is a spur to action. The solidarity of Jews and the aid they willingly give to young men of promise assists in developing whatever talent there may be in the community. The happy home-life of Jews, and the practical and undogmatic character of their religion, together with the absence of a priesthood, have contributed to give the *corpus sanum*, and thus the *mens sana*. Jewish reason has never been in fetters, and finally the weaker members of each generation have been weeded out by persecution which tempted or forced them to embrace Christianity, and thus contemporary Jews are the survival of a long process of unnatural selection which has seemingly fitted them excellently for the struggle for intellectual existence.

Turning from these general causes, it would be of interest to discover the reasons for the special ability of Jews in music, mathematics, metaphysics, philology, and finance. The chief cause of the musical pre-eminence of Jews lies, in all probability, in the home character of their religion, which necessarily makes music a part of every Jewish home: this too was the only direction in which their artistic sensibilities could be gratified. Jewish philology is in part due to their frequent change of country, and also to the fact that they have had an additional sacred language besides the vernacular. As regards finance, here the Jews have had their greatness thrust upon them: the

world forced them to become financiers centuries before finance became a power, and must not complain if Jews now profit by their start in financial experience. I am inclined to think that their finance has something to do with their decided leaning for mathematics. Metaphysics, with Jews as with others, is an offshoot of theology, but even here we can trace the influence of their mathematical tendency in the abstract nature of their thought. Altogether the productions of Jewish intellect strike one as being predominantly *abstract*—a result, doubtless, of their long life in cities and exclusion from Nature on the one side, and from the education which lies in handicrafts on the other. We may expect great mathematicians and philosophers from them, but not, I think, great inventors, biologists, or painters, till they have had time to throw off the effects of their long seclusion from Nature.

Finally, it is right that I should conclude with a confession and a warning. The former is perhaps unnecessary, but it is that this paper, which puts Jewish ability in a favourable light, emanates from a Jew. I am afraid this is bad taste, though I might defend myself by the example of the great Swiss naturalist, De Candolle, who has written a large book to show how superior Swiss naturalists are to all others. I should have been glad to hand over the investigation to a Gentile if I could have found one with sufficient interest in Jews to undertake the task, patience sufficient to look through some 30,000 names, and temerity enough to classify all the Jewish talents in their order of merit. Failing this, I have had to risk the imputation of bad taste, and shall be content if I avoid that of bad science. I can only say that I have throughout been conscious of the danger of being biassed in favour of Jews, and have guarded against it to the best of my power, taking a final precaution in warning the reader of the fact. At any rate, I do not think the results I have reached run counter to any common impression, and certainly not, in liberal England, to any popular prejudice.

APPENDIX I.

*Jewish Celebrities, 1785–1885.*¹

CELEBRITY is a relative term. In some cases it may mean that œcumenical fame which M. Renan has declared to be the one thing that is not vanity. In other cases, again, it may only indicate the local notoriety of a prominent member of a clique. There is always

¹ This list appeared first in the *Jewish Chronicle* of 25th September, 1885. M. Isidore Loeb and Professor Kaufmann have been good enough to give me some additions and corrections. Owing to these, the numbers given in the body of the paper no longer exactly answer to the data given in the Appendix, but the changes were too unimportant to need a revision of the numerical results.

the danger of including in any list of Jewish celebrities cases of the latter kind. This is the more probable with living notorieties whose true proportions are obscured by their very proximity to us. On the other hand, Jewish celebrities are scattered over all the lands of civilisation, and any collection made in one of them is too likely to ignore Jews of other countries whose fame may be local, but none the less deserved. Finally, now that the barriers of demarkation are removed, there is often a difficulty of identifying eminent men as Jews, and, still more, the necessity of excluding from our list men credited with being Jews without any warrant.¹

I have endeavoured to avoid these pitfalls by obtaining the following list of Jewish celebrities from the works specially devoted to recording the names of those who stand out from the rest of their countrymen because they have added to the wisdom or delight of the world. Almost without exception I have obtained the names of living Jewish celebrities from the following four works:—

Vapereau, "Dictionnaire des Contemporains," Paris, 1880 (7,528 names); T. Cooper, "Men of the Time," London, 1880 (3,108 names); A. de Gubernatis, "Dizionario degli scrittori contemporanei," Florence, 1879 (4,525 names); Bornmüller, "Schriftstellerlexikon," Leipzig, 1882 (2,367 names).²

For Jews of the past I have had resort to Oettinger, "Moniteur des Dates," Dresden, 1865-82, but as this includes no less than 167,000 names, I have not gone through it, but merely referred to it for names which I otherwise knew to be well known. In all I have obtained 330 names of Jews born between 1735 and 1835, and celebrated between 1785 and 1885, whom the compilers of these works consider worthy of distinction.³ I have only included those who have come under Jewish influences in their youth.

For reasons explained in the foregoing paper I have endeavoured to class these under various specialities in four different orders of merit. The few "illustrious" Jews are printed in black type, those whom I regard as "eminent" have their names in small capitals; the next grade including "distinguished" Jews have been placed in italics, and the remainder in ordinary type. The names of those who are Jews only in blood and not in creed, have an asterisk affixed to them; those of half-Jewish blood have an

¹ There is scarcely a celebrity of modern times whose name is at all Biblical, or nose not altogether snub, who has not been written down as Jew. Gambetta, Brahms, G. H. Lewes, Adelina Patti, Castelar, are among those I have seen. Even George Eliot could write, "You will be glad to hear that Helmholtz is a Jew." (M. Blind, George Eliot, p. 91.)

² I have obtained a few additional names from Warne's excellent "Bijou Biography" and from F. Martin's "Dict. Cont. Biog." On the other hand, I have not accepted the few Jewish names to be found in Drake's "Dict. American Biog.," 1871, or Heston's "Australian Dict. of Dates," 1878 (7 out of 924), as their contents did not seem to me up to the level of the other authorities. I felt, however, tempted to add Sir Julius Vogel from the last-named.

³ Servi, "Gli Israeliti d'Europa," 1873, has some 218 names, of which only 52 appear in the present list. Morais' "Eminent Jews of the Nineteenth Century" contains in the index some 285 names, only 74 of which occur in my list.

obelisk prefixed, which also implies another faith except in the cases of Franzos and Salvador. A single date after a name is that of birth, and implies that the subject is, so far as I can ascertain, still living.

The world delights more to honour those who delight it than those who instruct it, and we may therefore begin with the Protean aspects of

ART.

BELLES LETTRES.—And first among poets we have the great name of **Heinrich Heine*** (1799-1856), whom Matthew Arnold goes so far as to term "the greatest name in European literature since Goethe." Austria boasts of five Jewish poets, *L. A. Frankl*, Ritter von Hochwarth (1810), *K. Beck** (1817), and *S. Heller* (1823), author of "Ahasver," *L. Wihl* (1819), *L. Kalisch* (1814), and France, *E. Manuel* (1823). Italy has *D. Levi* (1821), and *S. Romanelli* (1757-1814), Germany, *M. Beer* (1800-33), author of "Struensee," and brother of the composer, and *S. Lipiner* (1850), who made a sensation a few years back with his "Entfesselte Prometheus," and finally, Denmark had *Henrick Hertz* (1798-1878). The next highest form of literary art at the present day is the novel, "prose-poetry," as the Germans call it. In this branch there occur the great names of *BERTHOLD AUERBACH* (1812-82), and *BENJAMIN DISRAELI* (1804-81), while *†K. E. Franzos* (1848) bids fair to reach equal heights. These are followed by *L. Kompert* (1822) and *A. Bernstein* (1812-83), the latter of whom turned from novel-writing to popularising science. These with *S. Kohn* (1825), the author of "Gabriel," and *M. Goldschmidt* (1819), may be regarded as the specifically Jewish novelists, and specimens of the work of the five foreigners have been translated into English, as well as into most European languages. Judaism may claim half of the brilliant talents of *†Paul Heyse* (1830), and there seems to be some probability that *Jules Verne* (1828) is a Jew. The novel is a branch of literary art in which women attain considerable skill. *Madame Fanny Lewald** (1811), Heine's sister, the *Prinzessa della Rocca** (1810), and the Danish novelist *Olivia Levison* (1847), known as "Sylvia Bennett," are the representative Jewesses. My authorities add the names of *A. Meissner* (1822-85), *Max Ring* (1817), and *A. Schrader* (1815-78). Jewish dramatists may follow Jewish novelists. The two most conspicuous names here are *S. Mosenthal* (1821-77), whose "Leah" traversed the boards of Europe, and *†Ludovic Halévy* (1834), the composer's nephew, and the most prolific of contemporary French dramatists. *J. v. Weilen* (1830) and *Hago Bürger* (1846) are two of the chief dramatists in Austria. *E. Abraham* (1833), *H. J. Cremieux* (1828), *A. P. A. Milland* (1836), contribute to the French stage, while *D. Kalisch* (1820-72), *E. Jacobson* (1833), and *S. Schlessinger* (1825) have contributed many comedies to the German stage. The late *†H. J. Byron* (1835-84) was partly of Jewish blood, his mother being a daughter of *Dr. Solomon* who found "Balm in Gilead." We have now to add

litterateurs of the essayist type. Under this head we may place L. BÖRNE (1786-1837), a brave warrior in the literary War of Liberation, G. RIESSER (1806-63), K. BLIND (1833), whose celebrity is more political than literary. A writer of quite a different class was GRACE AGUILAR (1816-47), whose volumes on "Home Influence" and the like still find favour among Englishwomen. To them we may add literary critics, the chief Jewish name in this branch being that of GEORGE BRANDES (1842), to whom we may add I. DISRAELI (1766-1848), of "Curiosities of Literature" fame, and M. BERNAYS* (1834).

PRESS.—In the last two rubrics we have almost passed the line which separates *belles lettres* from the press to which we may now turn. The chief reviews of Germany, *Deutsche Rundschau*, *Gegenwart*, *Nord und Süd*, are edited by JULIUS RODENBURG (1831) and †PAUL LINDAU (1839) respectively. Other German journalists of Jewish origin are I. LEIDERER ("Ichneumon," 1810), O. GUMPRECHT (1813), musical critic, O. BLUMENTHAL (1805), and M. SAPHIR (1795-1858), a comic writer of some power. There are besides two colonies of Jewish journalists situated at Vienna and Paris, the centres of *feuilleton* writing. At the former capital Heine's brother, G. HEINE (1805), won his title of Ritter von der Geldern, and D. SPITZER (1835), author of *Wiener Spaziergänge*, M. HARTMANN (1821), M. BARACH ("Dr. Märzroth") (1818), I. JEITTELES* (1814, "Julius Seidlitz"), F. GROSS (1849), E. KUH (1828-76), and I. NORDMANN (1820) have earned their meed of praise in commenting on the events of the day. In the Parisian Brotherhood of the Pen we have A. WOLFF (1825), in a way the *doyen* of the French Press whose position corresponds with that of G. A. SALA on our own, and A. WEILL (1813), whose relations with the press are now in the past. Besides these there are, or were, LEON HALÉVY (1802-83), the composer's brother and the dramatist's father, †PREVOST-PARADOL (1829-79), E. NAQUET (1819), and M. A. MILLAUD (1829), both brothers of French Senators, JOSEPH COHEN (1817), and two Germans located at Paris. MAX NORDAN (1849) and A. COHN (1819), the latter a literary Jack of all trades, who is known under the soubriquet of "August Mels." The names of the great Paris publishers, MICHEL (1821-75) and CALMANN LEVY (1819), may be added to the list of Parisian journalists. Italy gives us C. LEVI (1852), and Denmark had L. L. NATHANSON* (1780-1868).¹

MUSIC.—Turning from what we may call the arts of rhyme and reason, we may now enumerate Jewish celebrities in the art of rhythm and melody. F. B. MENDELSSOHN* (1809-47) stands out foremost here as the *wunderkind* of modern music; apart from the intrinsic merits of his own work he would deserve the world's gratitude for having re-discovered Bach. Some would reckon the

¹ The above names appear in Vapereau, Bornmüller, and De Gubernatis. To many of my readers names of special correspondents like M. de Blowitz, *Times* correspondent at Paris, and the late Dr. Schlesinger, London representative of the *Kölnische Zeitung*, would seem to deserve insertion as well as many of these obscurities.

musical merits of J. E. F. HALÉVY (1799–1862) as even superior to that of Mendelssohn, and J. MEYERREER (1794–1864) had the merit of being Wagner's master in his "first period." Ignaz Moscheles (1794–1870) comes, perhaps, next in the list of Jewish composers, though his reputation is much narrower than that of J. Offenbach* (1819–82), the musical voice of the Second Empire. Our own England offers the promise of even higher things in F. H. Cowen (1852). Most of the "titular" musical leaders in this country are reported of Jewish blood, Sir J. Benedict* (1805–85), Sir M. Costa* (1810–84), "born in Naples of an old Spanish family" (a Sephardi), and †Sir A. Sullivan (1844). Of minor composers we may select of Frenchmen N. M. Alkan (1803–75?), John Cohen (1835), and Em. Jonas (1827); of Englishmen, I. Nathan (1792–1865), to whose music Byron wrote his "Hebrew Melodies," and C. K. Salaman (1814), and I also find a Swede of some note in *J. A. Josephson (1818). But Jews have perhaps achieved greater triumphs as executants than as composers. The piano has found its greatest master at the present day in *Anton Rubinstein (1829), and *Joseph Joachim (1831) may be said to play first fiddle wherever he goes. Of great teachers Felicien David (1810–73) for the violin, and Ferdinand Hiller (1813) for the piano, may be here mentioned. H. Heller (1813), the brothers Herz (1806), and J. S. Herz (1797) are well-known French pianists, and the eccentric H. Cohn* ("Père Hermann") is a violinist of some reputation. The sweetest singers of Israel are M. Braham (1774–1856), who used invariably to compose his own songs, among which the "Death of Nelson" has become an English *Volkssied*, and Pauline Lucca* (1840).

THE STAGE owes much of its attractive powers in recent years to Jewish genius. The greatest name among French tragedians is acknowledged to be that of RACHEL FELIX (1820–58), and her only rival in European fame is nowadays S. Bernhardt* (1844). Other actresses of note on the French stage have been Madame Judith (1827), a relation of Rachel's, and I. Nathalie (1816). Of Jewish actors I find mentioned with honour L. Barnay (1842), A. Sonnenthal (1834), L. J. Booth (1796–1853), and his son †Edwin Booth, B. Davidson (1818–72), F. L. F. Loewe (1816), D. E. Bandman (1839), and E. Blum (1836). Of great managers mention should be made at least of B. Lumley (1812–75).

PAINTING AND SCULPTURE.—Finally we may conclude this list of Jewish contributors to Art by an enumeration of Jewish painters. Sir J. E. Millais has, we understand, Jewish blood in his veins, but we cannot include him among Jewish painters. The first place among these is held by Josef Israels (1824), celebrated for his delineations of Dutch fisher-life. Then comes E. Bendemon (1811), and A. Solomon (1835–72), once well known for his painting, "Waiting for the Verdict"; S. A. Hart (1806–81) deserves a place here as the first Jewish Royal Academician; W. Goodman. My authorities add the following names:—J. A. M. Jacobs (1812), the brothers C. E. Lehman (1814) and R. Lehman (1819), E. Levy (1826) and H. L. Levy (1840), B. Ulmann (1829), and J. Worms

(1832), all in France, and F. E. Meyerheim (1808-79), in Germany. Of sculptors there are two who have attained to some eminence in France, *Adam Solomon* (1818-81) and H. J. Daniel (1804), while E. Wolff (1814) is known in France, and another E. Wolff (1802) in Italy. Only two architects occur in my authorities, *G. Basevi** (1795-1845), Lord Beaconsfield's uncle, and architect of the Fitzwilliam Museum, Cambridge, and A. Hirsch (1828).

II.—SCIENCE.

Turning from art that delights to science that instructs, we may begin by enumerating the few Jewish names who have reached any kind of eminence in PHILOSOPHY. Of these the most *genial*, though not the best known or the most influential, is SOLOMON MAIMON (1753-1800), one of the most remarkable men that Judaism has produced. Though only trained in the ordinary Rabbinic schools, he displayed metaphysical powers of a high order. His genius was recognised by Kant, and though soon obscured and eclipsed by the great Epigonoi, Fichte, Hegel, and Schelling, it is nowadays recognised that his criticism struck at the root of the Kantian system. His remarkable self-analysis in his autobiography would stamp him as no ordinary man; it is the nearest to Rousseau's "Confessions" of all self-revelations. Maimon was also one of the earliest forerunners of Symbolic Logic (*cf.* Venn, "Symbolic Logic," pp. 377, 420). The only other names of importance are those of H. STEINTHAL (1828), *M. Lazarus* (1824), and *A. Franck* (1809), Membre de l'Institut and editor of a philosophical encyclopædia. The former, however, has gained his greatest laurels in philology, the two latter in literature of an essayist type. Lassalle perhaps deserves mention here for his book on Heraclitus. One of my authorities adds a name unknown to me, Melchior Meyr (1810-71).¹

HISTORY, philosophy teaching by example, has chiefly attracted Jews so far as it affects themselves. Of Jewish historians, H. GRAETZ (1817) is undoubtedly the greatest, and deserves to rank by himself, though his judgment is not as great as his erudition. *J. M. Jost* (1793-1864) comes next to him, and then †*J. Salvador* (1798-1860), who was a potent influence in his way in France. *I. De Costa** (1798-1861) also wrote the history of the nation he had deserted. Jews have also written history of other nations, notably Sir F. COHEN PALGRAVE* (1788-1861), the first in point of date of the scientific historians of England. *G. F. Herzberg* (1821), the Greek historian, is, I believe, a Jew, and so were S. Romanin (1808-61), the historian of Venice, and P. Jaffé* (1819-70), who drew up the *Regesta* of the Popes. W. Frankl* (Fraknoi) (1843) is one of the chief historians of Hungarian, and M. Philipson (1846) and H. Breslau (1848) are German historians of promise. Young Prof. L. Geiger (1848) promises to be the leading authority on the Renaissance; H. Cohen (1810) an authority of numismatics. A

¹ Professor H. Cohen, the Kantian, has not yet got into the dictionaries. N. Krochmal (1785-1840), who made a not unsuccessful attempt to combine

few antiquarians may follow the historians. *M. A. Levy* (1817-72), one of the chief authorities on ancient epigraphy, *J. L. Klein* (1810-76) wrote the most voluminous work on the history of the drama; *G. Coen* (1847), an Italian bibliographer, and *Mr. L. B. Phillips* (1842), the compiler of an extensive "Dictionary of Biographical Reference."

ECONOMICS studies the sinews of history, and Jewish economists have been some of the most influential names in the science. *DAVID RICARDO** (1772-1823) is only second to Adam Smith. *KARL MARX* (1808-83) was the "headcentre" of modern Socialism, though this was led socially by the gifted *FERDINAND LASSALLE* (1825-63), who will take even higher rank when we come to politicians. Other Jewish economists are *E. Morpurgo* (1840-85), and *E. Luzzati* (1843). Statistics is the handmaid of Economics, and three Jewish names, *M. Block* (1816), *J. Körösi* (1844), and *L. Levi** (1821), are distinguishing in this science.

MATHEMATICS.—Here we reach another speciality of Jews. At their head stands the name of Professor *J. G. SYLVESTER* (1814), probably the greatest living pure mathematician, if his rival and friend, Professor Cayley, does not usurp that place. Of equal rank in the past was *C. G. J. JACOBI** (1804-51), after whom certain intricate functions are termed "Jacobians." Then come *L. Kronecker* (1823) and *L. Cremona* (1830), and these are followed by *H. Filipowski* (1817-72), the compiler of some anti-logarithmic tables, *O. Terquem* (1782-92), *M. Levy* (1791-53), *B. Gompertz* (1779-1865), the first actuary of the "Alliance," and one of the earliest students of "Double Algebra," *L. Bendavid* (1762-1783), *Mendelssohn's* friend, and *I. Blum* (1812).¹

ASTRONOMY has some very great names of Jewish blood, though some of them kept not their Jewish faith. Of these the greatest is *Sir W. HERSCHELL** (1738-1822), and his sister, *C. Herschell** (1750-1848). To these we can add *H. Goldschmidt* (1802-66), the discoverer of 14 asteroids, *W. Meyerbeer*, Meyerbeer's brother, and first cartographer of the moon (1797-1850), and *M. Löwy* (1833), of the Paris Observatory.

BIOLOGY.—Few Jews seem to have devoted themselves to this subject, though *F. Cohn* (1828) and *S. Pringsheim* are among the greatest names in German botany. In the department of physiology, Jews, however, count a large number of comparatively important names. *R. Remak* (1816-65) was one of the greatest in the past, *G. G. Valentin* (1808-83) wrote one of the best text-books in the "fifties," and "Valentin's knife" is still used by specialists. Both *J. Bernstein* (1839) and *J. Rosenthal* (1836) have had books in the "International Scientific Series," and *J. Cohnheim* (1839-84), *H. Cohn* (1838) the oculist, and *G. Schwalbe* (1846) are other Jewish

Ibn Ezra and *Hegel*, will probably always be kept out of them by his choice of Hebrew to express his views.

¹ *G. Cantor*, the historian of mathematics, *T. Reiss*, the physicist, and the first Jew to enter the Berlin Academy, have escaped the notice of the biographers. Professor Schuster has only to wait.

names connected with physiology, most of them as specialists on nerves. Other names will meet us among the Jewish doctors.

PHILOLOGY.—But it is chiefly in philology that Jewish science is so predominant. The philosophic side of philology is nowadays dominated by the school of M. LAZARUS (1834) and H. STEINTHAL (1828), who have founded the science of national psychology. Carl Abel (1839) is doing good work in treating of Comparative Lexicography, and L. Geiger was even a greater name (1829–70). M. Bréal (1832) is one of the greatest authorities on Comparative Mythology. Classical Philology is not without its Jewish masters, L. Friedländer (1814), the greatest living authority on the silver age of Rome, J. Bernays (1834–82), W. Freund (1806), on whose Latin dictionary all those used in England are founded, H. Weil (1818), Membre de l'Institut, Bernhardt* (1800–75), Lehrs* (1802–78), and L. Meyer (1833). Modern languages have also found their masters among Jews. The gifted A. L. Davids (1811–31) for Turkish, A. Vambéry* (1832), and M. Bloch* (1815) for Hungarian, A. Darmesteter (1846) for French, D. Sanders (1819) for German and modern Greek, M. Landau (1837) for Italian, are here the Jewish names, while H. Bacharach (1810) is mentioned as a translator from German into French, and H. G. Ollendorf (1805–65) invented the method by which modern languages are still chiefly taught. But it is only natural that Jews should take the highest rank in Oriental Philology. In Germany TH. BENFEY* (1809–82) held the same position as Professor Max Müller does in England. His great speciality was Sanscrit, as is that of G. J. Ascoli (1829) and E. Brandes (1847).¹ Coptic is that of C. Abel, Egyptian of G. Ebers* (1837), Hindustani of G. G. Leitner* (1840), and, it seems, all Eastern tongues of Dr. L. Loewe (1809). M. James Darmesteter (1849) is now one of the chief Zend scholars, and promises to be one of the most influential Orientalists in Europe. In the Semitic branches we find even more Jews. Professor J. OPPERT (1825) is perhaps the leading Assyriologist of the day, and has advanced the development of cuneiform more than any living man after Rawlinson. The promise of F. Luzzato (1829–54) in the same branch was cut off by an early death. The late M. A. Levy was an authority on Phœnician (1817–72). In Arabic G. Weil (1808) translated the 1,001 Nights, and wrote the Standard History of the Caliphs. The two Derenbours, J. Derenbourg père (1811) and H. Derenbourg fils (1844), S. Munk (1805–66), the Editor of Maimonides, I. Goldziher (1840), (also known for a rather wild book on the mythology of the Hebrews), and D. H. Müller are all well-known Arabists. We naturally meet with a crowd of Jewish names connected with the Hebrew language and literature. Of these the two greatest are undoubtedly LEOPOLD ZUNZ (1794) and MORITZ STEINSCHNEIDER (1816); though A. GEIGER (1810–74) displayed talents of as wide range as they. Graetz we have already mentioned, and S. L. Rapaport (1790–1867), co-founder with Zunz of modern Jewish

¹ I cannot find T. Goldstücker (1819–71) in any of the reference books.

scholarship, *S. D. Luzzato* (1800–65), *Z. Frankel* (1801–75), the chief of scholarly Talmudists, and *longo intervallo J. Fürst* (1805–73), author of a Hebrew Concordance and Lexicon, are the next greatest names. *A. Jellinek* (1821) has never concentrated himself sufficiently to do justice to his powers, and the same may be said of *M. M. Kalisch* (1828–85). I would add the names of my friends *Dr. A. Neubauer* (1832) and *Dr. M. Friedländer* (1833) to the above. The versatile *L. Philippsohn* (1811), *M. Kayserling* (1828), and *D. Castelli* (1836) follow, and these may be succeeded by an alphabetical list of the remainder, *Dr. H. Adler* (1839), the Chief Rabbi, *Dr. N. M. Adler* (1803), *E. Benamozegh* (1822), *F. F. Benary** (1805), *A. Benisch* (1811–78) *J. H. Biesenthal** (1800), *I. Cahen* (1826), *S. Cahen* (1796–1863), *E. Carmoly* (1885–75), *B. Consolo* (1815), *M. Lattes* (1846–84), *I. Leeser* (1806–68), *D. Levi* (1740–99), *M. Mortara* (1815), *M. Margolionth** (1820–82), *M. Shapiro* (1816), and *M. Soave* (1801–83).¹

III.—PRACTICAL LIFE.

POLITICS.—Considering the restrictions under which they have laboured, Jews have shown marked ability for politics. Here they have two names of the very first rank. **Lord Beaconsfield*** (1804–81), whatever we may think of his political achievement, is certainly entitled to rank among the first ten men of his time in England. **Ferdinand Lassalle** (1825–63), the Messiah of modern Socialism, made the greatest impression of any man of his time in Germany; in 1863, when he died in a duel at the early age of thirty-eight, Bismarck and he were regarded as the two foremost men of the Fatherland.² These great names are followed by those of **JULES SIMON*** (1814), whose Jewish parentage is not certain, **L. A. CREMIEUX** (1796–1881), to whom the French nation awarded a public funeral, and **E. LASKER** (1839–83), the leader of the National Liberal Party in Germany. Other important personages are **A. Fould** (1800–67), **M. Goudchaux** (1727–1862), **G. d' Eichthal*** (1804), and **A. Naquet** (1834) in France; **L. Bamberger** (1828) and **J. Jacoby** (1805–77) in Germany, the latter the leading spirit of German Liberalism; and **I. Kuranda** (1811–84) and **E. Horn** (1825–75) in Austria; **T. Massarani** (1826) may follow here, though more distinguished as poet and painter than as politician. **W. Löwe** (1814) and **H. B. Oppenheim** (1819–80) in Germany; **Sir F.**

¹ These are all the names of Hebraists occurring in the books of reference to which I restrict myself. The lacunæ under this head are naturally many. I can find nowhere any mention of **Barasch**, **S. Benedetti**, **A. Berliner**, **D. Chwolson***, **E. Deutsch** (1829–73), **L. Dukes**, **R. Eisel of Slonim**, **I. Erter**, **Fassel**, **J. Friedman**, **J. L. Gordon**, **Jos. Halévy**, **Harkavy**, **N. Krochmal** (1785–1820), **L. Löw** (1811–75), **Mappo**, **J. S. Nathanson**, **Reifmann**, **Rosin**, **Schorr**, **Weiss**, not to speak of younger men whose fame is yet to come. On the other hand, Cooper inserts **J. Levisohn*** (1797), whose only claim to distinction seems to be that a book he wrote was suppressed, and only two copies of it are now said to be in existence.

² A brilliant study of the last year of his life is contained in **George Meredith's** "Tragic Comedians."

Goldsmid (1808-80), Baron Lionel de Rothschild (1808-81), Sir D. Salomons (1797-1873) and Sir B. S. Phillips (1811), in England, and MM. Millaud (1834), F. David (1796-1879), and Bédarrides (1817) in France, complete the list of politicians contained in my authorities. I. Artom (1829) may be added as a distinguished diplomatist.

THE PROFESSIONS also yield their quota of Jewish celebrities, though it is extremely seldom that a professional man reaches international rank. *Medicine* has been the favourite among Jews, who count among their number, in addition to those mentioned as physiologists, the names of *Traube* (1818-76), *C. Lombroso* (1836), the greatest of Italian doctors, *F. R. Liebreich* (1830), the ophthalmologist and inventor of the "eye mirror," *A. Hirsch* (1817), the standard authority on "medical geography," *Zeissl* (1812), the chief authority on syphilis, and *K. F. Canstatt* (1807-50), whose "*Vierteljahrschrift*" was the repository of the first German medical work of the time. Less important names are *M. Heine**, brother of the poet (1807), *H. A. Bardeleben* (1819), a distinguished surgeon, *E. Altschul* (1812), a leading homœopathist, *Störk* (1820-75) the laryngoscopist, *M. L. O. Liebreich* (1839), brother of the ophthalmologist and discoverer of "chloralhydrate" with all its dubious uses; *Germain Sée* (1818), and his son *Marc* (1827), *A. Lombroso* (1813), *L. Mandl* (1812-81), *M. Lévi* (1809-72), and *A. Mayer* (1814) in Paris end the list of distinguished Jewish medical men. *Law* follows with the names of *E. Gans** (1798-1839) as one of the chief leaders in the German school of legal theory; *Sir G. Jessel* (1824-83), late Master of the Rolls, as one of the greatest practical lawyers of the age. *J. P. Benjamin* (1811-84) was the chief English barrister of his time, as well as one of the "headcentres" of the Southerners. *J. Glaser** (1831-85) has been recently described in the newspaper obituaries as "Austria's greatest jurist," and *H. Dernburg** (1829) is an important German legist. Other names of Jewish lawyers are *H. F. Jacobson* (1804-68), *T. M. C. Asser* (1838), who recently represented Holland at the Congo Conference, *I. Luzzati* (1847) and *M. Levi-Vita* (1840), two important Italian legists, and *J. Bédarrides* (1804-69), in France; *Lassalle* deserves to be mentioned here again for his "*System des erworbenen Rechts*." *Military* and *Naval* celebrities among Jews are only represented by one in each branch: *MASSENA* (1758-1817) on land, if we may accept Lord Beaconsfield's account of him as a Jew whose real name was "*Ménasse*,"¹ and *U. P. Levy* (1781-1862) was an Admiral in the United States Navy of some note. *The Church* has not been without its Jewish ornaments; the sober *G. A. W. NEANDER** (1789-1850), whose *Church History* is still authoritative; the brilliant *P. Cassel** (1827), *M. Ballagi**

¹ "Coningsby," IV, xiv. *M. Loeb* informs me that there is nothing more in this identification than a "*jeu de mot*." Much the same may be said of other parts of the same chapter which everybody has read. Everybody has also read *Thackeray's* inimitable parody of it in "*Codlingsby*," with the amusing climax, "The Pope is one of us!"

(Bloch), the leading Protestant theologian in Hungary, Bishop Hellmuth* of Huron (1820), the sole living Bishop of Hebrew blood, and D. Norsa* (1807), are other names. Chess is nowadays a profession, and mostly a Jewish profession; the two chief living names, W. Steinitz (1837) and J. H. Zukertort (1842), being those of Jews, as well as two masters of the past, A. Alexandre (1766-1850) and J. G. Löwenthal (1810-76). Education gives us the names of D. Friedlander (1750-1834) and Levi-Alvares (1794-1870).

COMMERCE AND PHILANTHROPY have been usually combined among Jewish celebrities. This is certainly the case with S. Heine (1766-1844), the Rothschilds, Meyer (1743-1812), Lionel (1808-81), Edmond (1826), and James (1844-84), Sir M. Montefiore (1784-1885); the Pereires, Edmond (1800-75), and James (1806-80), L. R. Bischoffsheim (1800-84), J. Mires (1809-71), and J. Truro (1775-1854). These all obtained fortunes in finance. Of great masters of industry there is only one important name, that of B. H. Strousberg* (1828-84), the "Railway King" of Germany; the only other name is that of J. Alexandre (1804-76), a pianoforte manufacturer.*

SALONS of importance have been presided over by brilliant Jewesses. The three chief centres of cultured life at Berlin at the beginning of this century were the salons of Rahel von Ense (1771-1833), Dorothea Mendelssohn-Schlegel* (1769-1839), and Henriette Herz (1764-1847).¹

TRAVEL may conclude our new list with the names of Joseph Wolff* (1795-62), the eccentric; †W. G. Palgrave (1826), who opened up Central Arabia; A. Vambéry* (1832), the leading authority on Central Asia; †Sir F. H. Goldsmid, the Persian traveller; G. Oppert (1836); and N. Davis* (1812-82), the explorer of Carthage, if he were a Jew.

The above list does not claim or aim to be exhaustive. It only professes to contain the names of such Jews as have found their way into dictionaries of general biography. By restricting myself thus I have been obliged to insert many names whom I should not myself have thought worthy of mention, and to omit others who appear to me to have been undeservedly overlooked. I have given a few of the latter in footnotes, but have not referred to the many young men of promise now springing up, as my comparison is mainly limited to those over fifty, at which age men first obtain admission to the rolls of fame. On the whole, I do not find many important omissions; even those of the third class rarely fail to attract the attention of the experts in celebrity. I have been obliged to restrict myself in this way as the immediate object of the compilation has been to find materials for discussing the much vexed question as to the relative ability of Jews. To compare them with others we must take the same sources as those from which the names of celebrities generally are taken. For the same purpose it

¹ One of the most important English salons was that of Countess Waldegrave, Braham's daughter, while the gifted family of Raffalovitch holds one of the chief salons in Paris at the present day (*Times*, Sept. 15, 1885).

has been necessary for me to undertake the invidious task of classing the names in four classes corresponding to the four highest classes fixed with mathematical accuracy by Mr. Galton in his "Hereditary Genius," 1869 (p. 34). The fourth class cannot be complete, many names coming by accident into the dictionaries. For purposes of comparison the names only of those in black letters, capitals, or italics are to be considered, though the remainder are useful as means of judging the subjects of Jewish pre-eminence. Even the third class are reckoned by Mr. Galton to reach the average of an English judge of the best times of the Bench, and every one of the Jewish celebrities are far indeed above the average of those men who gain the ordinary prizes of life.

APPENDIX II.

Illustrious Europeans (1785-1885).

I have made the following estimate of the ability of the chief civilised nations founded on the number of first class men they have produced during the century 1785-1885, as compared with the number of males who have reached fifty during that period. The results are of course precarious owing to the difficulty of deciding upon the names of first class men. But they agree sufficiently with popular impressions to deserve record. The validity of the results would be much increased if we could obtain lists of the second class men.

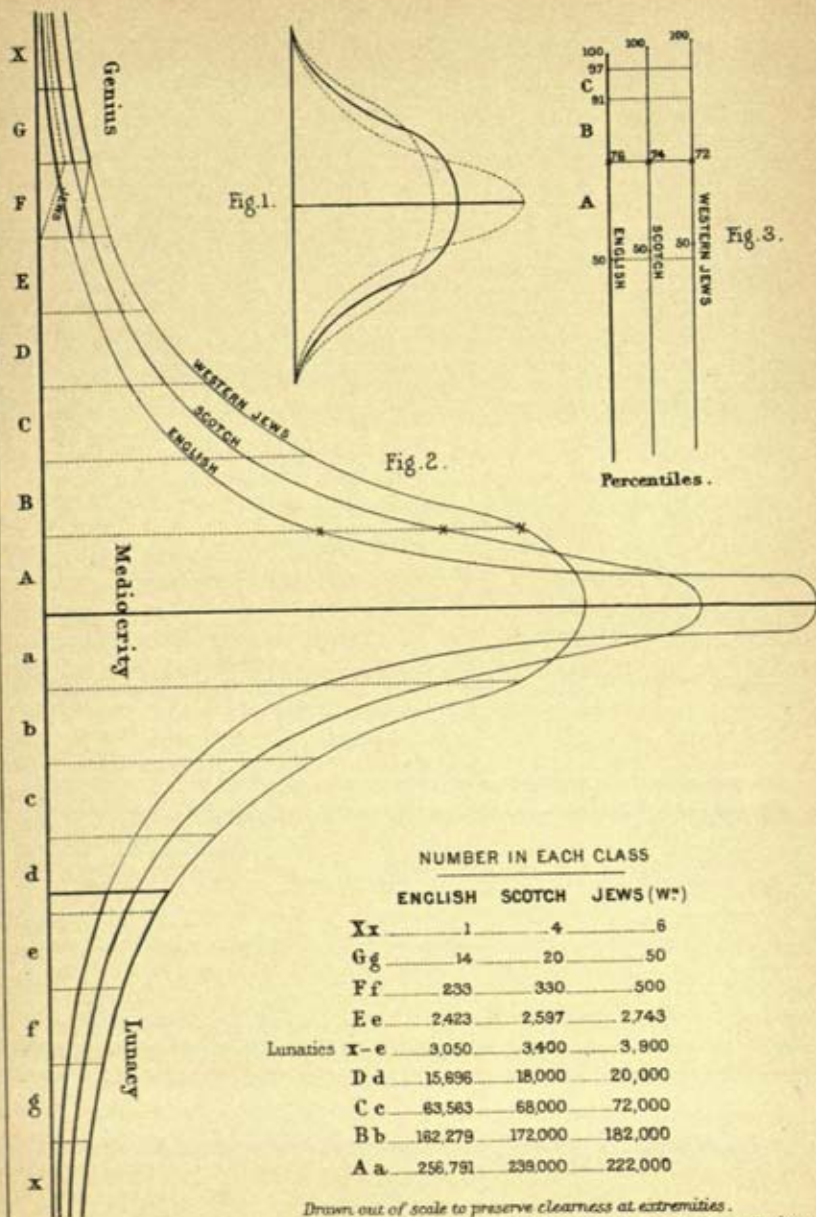
The third column of figures give the relative order of ability of the different nationalities. The discrepancy between the table of the general ability of the different countries, and that in the note on page 359, giving that of the Jewish ability in the same, indicates the influence of the social environment in making talent "kinetic" instead of "potential." The English names and numbers may be taken as confirming Mr. Galton's estimate of one genius per million males over fifty. At first sight there seem to be nearly double that number. But G. Eliot was a woman, Pitt and Byron never reached fifty, Bentham and Faraday are doubtful (though this is counterbalanced by the claims of Shelley and Turner), and Darwin is a man of many millions. So that there have been but 12 certain geniuses among 10 or 11 millions over fifty. I would also call attention to the remarkable groupings of the births of the Englishmen: three clustered around the date 1770 (Wellington 1769, Wordsworth 1770, Scott 1771), five round 1810 (Darwin, Gladstone, and Tennyson all 1809, Thackeray 1811, Dickens 1812), and three round 1820 (Ruskin 1819, Eliot and Spencer 1820). Judging from the middle cluster, it would seem that a nation gives birth to its greatest men when in the throes of its severest struggles. There is, as it were, an incarnation of the *Zeitgeist*. It would be interesting to see if the next batch of European genius has any similar relation to the year 1848.

Nation.	No. of million males reached fifty 1785-1885.	No. of first class men.	No. per million.	Names.
Austria ..	11	2	·2	Kossuth (?), Mozart.
England ..	10	18	1·8	Beaconsfield, Bentham (?), Byron, Carlyle, Darwin, Dickens, <i>G. Eliot</i> , Faraday (?), Gladstone, Macaulay, Pitt, Ruskin, Scott, Spencer, Tennyson, Thackeray, Wordsworth.
France ..	12	12	1	Comte, Dumas père (?), Gambetta, V. Hugo, Laplace, Lesseps (?), Mirabeau, Napoleon, Pasteur, Renan, Robespierre, <i>G. Sand</i> , Thiers.
Germany ..	10	19	1·9	Beethoven, Bismarck, Fichte, Gauss, Goethe, Grimm, Hegel, Heine, Helmholtz, Lassalle, Mendelssohn, Moltke, Mommsen, Schiller, Schopenhauer, Schubert, Stein, Wagner.
Italy	7	3	·4	Garibaldi, Leopardi (?), Mazzini.
Russia	23	2	·1	Skobelev (?), Turgenief.
United States	8	2	·3	Emerson (?), Washington (?).
All	81	57	·7	

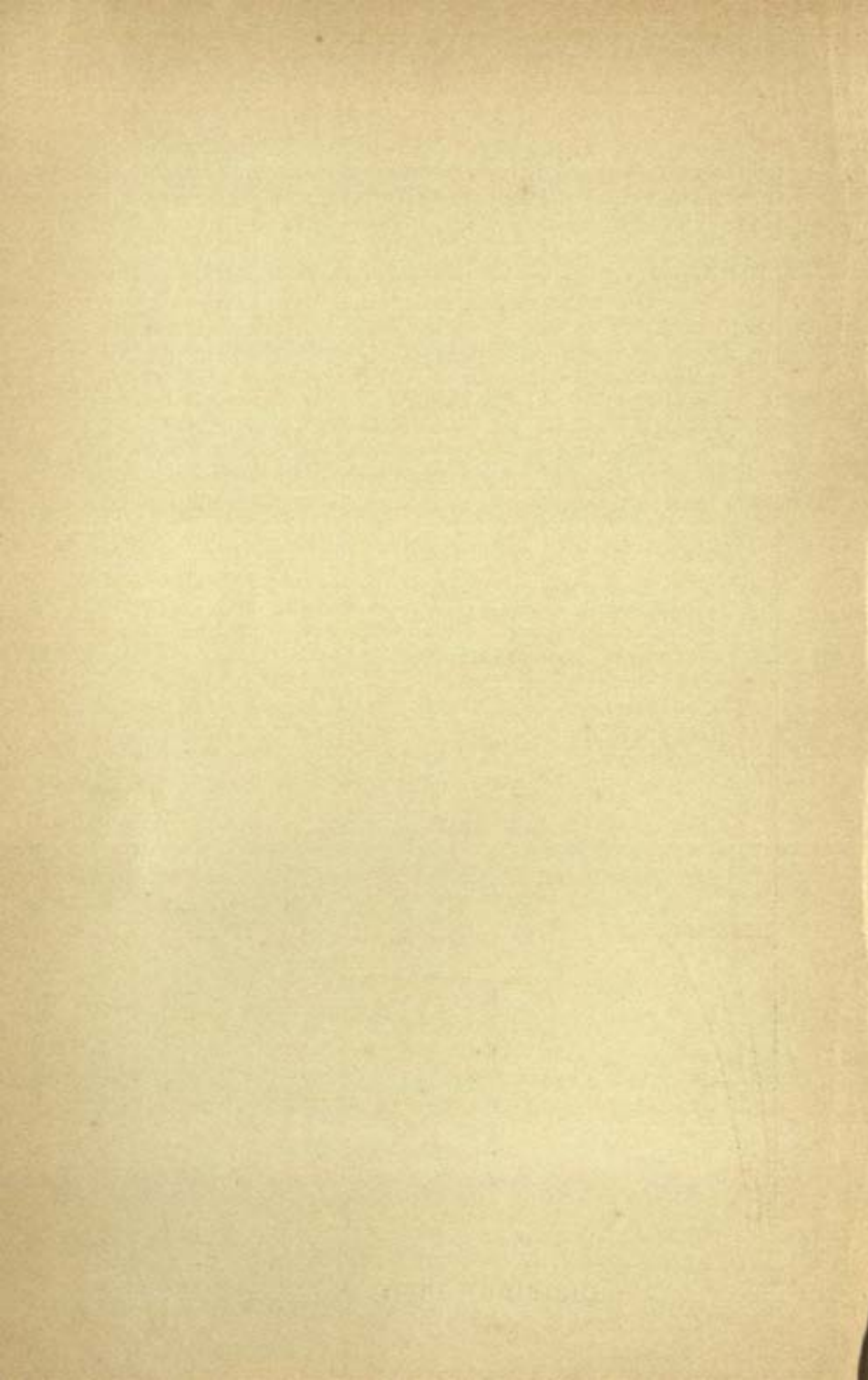
Explanation of Plate XV.

Fig. 1 is only intended to illustrate the fact that closed curves on the same side of the same base, and containing the same area, must cross one another. This principle applied to the curves in fig. 2 enables us to say that if there are more Scotchmen and Jews in the extreme classes, there must be less of them in the middle or mediocre class.

Fig. 2 gives, as it were, the shape of the boundary walls of a million Englishmen, Scotchmen, and Jews penned into sixteen classes, ranging regularly in order of ability. The horizontal dotted lines give the different classes, named symmetrically from the centre line *A, B, C, &c.*, towards one end, *a, b, c* towards the other. It is assumed that a class indicated by a small letter is of the same size as that represented by a large letter. The numbers



*Drawn out of scale to preserve clearness at extremities.
Dark parts obtained from observation; the rest by interpolation.*



in each class in the three races are given in the Table. The English numbers in this are from Mr. Galton's book; the Scotch and Jewish numbers have been calculated from—(1) the number of celebrities; (2) the number of lunatics; (3) the principle illustrated by fig. 1, that the curves must cross.

Fig. 3 is merely an illustration of the statement on page 361, the crosses marking the percentiles shown to be equal by the same crosses in fig. 2. Properly speaking, the Jewish and Scotch percentile bars ought to be elastic and extend equally on both sides of the English fiftieth percentile. A more accurate representation of the relative ability of each percentile among the three races would be to draw the "ogives" for each so that the ordinates corresponding to the 72nd, 74th, 76th percentile respectively should be equal. This would enable us to determine the relative ability of each percentile. But it would be misleading to attempt such accuracy at present, and the more popular statement of the text may serve as a rough indication in the meanwhile.

ANTHROPOLOGICAL MISCELLANEA.

The SCOPE of ANTHROPOLOGY, and its RELATION to the SCIENCE of MIND.

By ALEXANDER BAIN, LL.D.,

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THE science termed Anthropology, in its literal rendering "Man-Science," cannot be called new. But the derivation of a Greek name teaches nothing. Man, as the most complex thing in nature, has many aspects, and gives birth to many sciences, and we may not yet have exhausted these. It is the case that, within a few years, a mode of approaching the study of mankind, having certain claims to novelty, has been originated, and been made the basis of a specific treatment, and of societies for conducting that treatment, the present section of the British Association being one.

So recent, however, is the origin of this science, that its precise compass is by no means clearly settled. At all events, I think I can discover some vacillation and incoherence in its details, and especially in the relationship between it and the previously existing sciences of man.

Let me first quote the definition of the subject by the leading authority. According to Professor Huxley, it deals with the whole structure, history, and development of man. Still more specific is the enumeration of its parts, in the article devoted to it, in the *Encyclopædia Britannica*, also by a great authority. These are six, viz.:—I. Man's Place in Nature, that is, his relation or standing in the animal kingdom, as a whole; II. His Origin, whether from one pair or otherwise; III. The Classification of the Races, with the delineation of their several characteristics; IV. The Antiquity of Man, which is necessarily connected with his mode of origin, although susceptible of a separate treatment; V. Language, as essentially bound up in the intellectual advancement of mankind; VI. The Development of Civilisation as a whole.

Now it needs a little reflection to discover what brought these six topics together under a new designation. The topics themselves are not all new; most of them are very old, as well as being provided with understood positions in the framework of our knowledge. The greatest novelty attaches to the antiquity of man. Next is man's place in Nature, which has received a distinctive

¹ A Paper read in the Anthropological Section of the British Association at the Aberdeen Meeting, 1885.

treatment of late years. Allied to this is the question of man's origin; while the three remaining subjects, races, language, and civilisation, are neither new nor unplaced in the cycle of the sciences. These last have usually been discussed in total separation. Language stands entirely by itself, and although necessarily connected with the races, on the one hand, and with the totality of civilisation, on the other, gains nothing by being included in the same book, or in the same society, with these two great departments. Language was in the programme of the British Association long before Anthropology was taken up.

I believe that if the six subjects named were regarded merely as satisfying rational curiosity, and as containing applications to our common utilities, like Chemistry or Human Physiology, they would never have been grouped into the present bundle. The reason must lie deeper. It was very soon obvious that the three most recent of the six departments—Man's Place in Nature, Antiquity of Man, and Origin of Man—had bearings of an altogether transcendent kind. They were seen to relate to the everlasting mysteries of the universe—the Whence, the How, and the Whither of this earth, and its inhabitants, ourselves included: offering alternative and rival solutions to those already in the field. The discussion of man's place in nature has laid before us the view that he is, after all, merely the highest type of the zoological series. The inquiry into his antiquity points back to tens of thousands of years; his origin is transferred from one pair to something entirely different, although not precisely stateable. In order to assist in giving validity to these innovating suppositions, and to contribute other modifications of the traditional creeds, the three remaining sciences, Races, Language, and Civilisation, have been called in. The study of the races is so conducted as to militate against the commencement from one pair. The growth of languages is invoked to show the need of a great extension of the time hitherto allotted to the duration of man on the earth; the history of civilisation is turned to account, as showing the human origin of all our institutions, and especially the greatest of them, Religion. Instead of our own creed, the creed of Christendom, being an exclusive revelation, we are now told to face the alternative solutions—that the religions of mankind are either all equally Divine or all equally human: both views having their representatives.

It is quite true that the British Association carefully and rightly abstains from debating those issues; yet we cannot blink the fact that they alone have afforded a basis of union to the present section. If the subjects were to be viewed in a perfectly cold and dilettanti fashion, they would be very differently distributed. An Anthropology section unconnected with the highest questions would be made up of a very different aggregate: it would leave out some of these, and take in others. Civilisation, for example, is only a part of the vast science of Sociology, which should have a section or sub-section to itself, and include among other things the theory of government. Psychology, as the parent

science of the human mind, would have to be directly and distinctly named, and not left to random allusions.

The vacillation observable in the bringing up of the several topics, in the several sections of the Association, confirms the position now stated. The Antiquity of Man is well placed in the Geological section, and has often been considered there; indeed, the strongest evidences of all are of a geological character. The place of man in nature is a problem of Zoology, and could be easily kept to that section. The Races of Man at present existing could come under Geography; and everything relating to them, customs, usages, language, creeds, would all be accepted in that section. The former races would belong to History, but there is no Historical section, and so that topic is not fully provided for.

Another vacillation is seen in the double placing of the valuable statistics of measurement of human attributes, bodily and mental, so ably carried out by the president of the section, along with some other energetic observers. This is a recognised topic of Anthropology, but it has also been reported on to the section of Economical Science and Statistics; no doubt with a view to its practical bearings on education and otherwise.

Thus, then, while Geology and Zoology have handed over to us here the burning and boiling questions that appertain to themselves, Geography, the mildest of sections, rising to a sensational heat only by the presence of a Livingstone—if any one were to bring before it a new missing link—would remit the perilous honour to our section.

I must now narrow the ground as fast as possible to come to the points of my paper: the necessary references to the science of mind, in the carrying out of the various anthropological inquiries.

In 1875 the Anthropological Institute of London requested Mr. Herbert Spencer to map out the Comparative Psychology of Man, with a view to provide some sort of method in handling the various questions that came before the Institute. The desire was natural and just. Where so much depends on the varieties of human character, some plan of recording those varieties is needed.

Now to formulate a scheme of human character is not an easy matter. It requires a very consummate acquaintance with the human mind to begin with, and also a considerable amount of study of the mental peculiarities of the inferior animals. In fact, for the objects of Anthropology, man and the animals must be viewed in a line—not, indeed, so as to beg the question in dispute, as to the nature of the barrier that divides them—but for the better showing of agreements and differences, with a view to facilitate the discussion of that barrier.

Mr. Spencer, in obedience to the request of the Institute, drew up a provisional Scheme of Character, and I do not intend, at present, either to re-model or to criticise that scheme. I remark, however, that it pre-supposes a careful analysis of the mind, an indication of the fundamental attributes of our mental nature, physical, intellectual, and moral, and some mode of estimating the degree or amount of these several attributes. The problem of

measurement comes up as indispensable to precision in stretching the plan of character.

An example of the questions that crop out in reviewing the development of mankind is the relative preponderance of the Senses and the Intelligence. It is a peculiarity of many of the lower races to have preternatural acuteness of the special senses—sight, hearing, smell—which, however, would seem to obstruct, instead of aiding, the higher functions of the intellect; for example, the reasoning powers. Yet intellect is grounded upon sense: our thoughts are furnished by the things that we see, hear, touch, smell, taste; and the better provided we are with sensations, the more intelligent must we be. There is here a seeming contradiction, or paradox, of the human constitution, which needs to be reconciled by a deeper view of the mental processes. In fact, it needs a delicate line to be drawn between two modes of sensibility—one contributing to intellectual growth, the other interfering with it. We shall soon see the bearing of this.

I recur to the all-important topic of Measurement, to which the remainder of the paper will be directed. Your section has amply acknowledged the necessity of a mathematics of man, as a prelude to accurate discussion of your questions. You have a standing committee for conducting the operations, under your energetic president. You begin properly with physical characters, and build up a statistics of our own countrymen in the various points of stature, weight, breathing capacity, strength of arm, and the correspondence of these with age and sex.

It is an error to suppose that mental qualities do not admit of measurement. No doubt the highly complex feelings of the mind are incapable of being stated with numerical precisions; yet by a proper mode of approaching the subject, a very considerable degree of accuracy is attainable. We must, however, begin at the beginning, and that beginning is sensation, or the quality of the several senses, especially the higher senses of sight and hearing. A distinction needs to be drawn between the two susceptibilities of any sense—the susceptibility to pain and pleasure, and the delicacy of discrimination of different degrees in shades of impression. These two attributes play a very different part in animal life, and the one is not a key to the other. Each is to be measured in its own way: pleasure and pain, by the expression and the direction of the will; degree of impression by such indication as the subject of the experiment can afford.

Take the case of Sight. Your section has led up admirably to this subject. Beginning with the practical question of colour-blindness, for which perfect tests have been devised, Mr. Roberts has prepared a scale of colours and shades of colour to test the delicacy of individuals to show colour—a most important determination to show the kind of aptitude of each person for special vocations; and, indeed, entering into the final direction of the intellectual powers. For human beings, this determination is particularly easy; it is not so easy for the animals, who can make

no proper sign, but it is of equal importance in the gauging of their capabilities, both sensible and intellectual.

It is probable that the pleasure of colour and the discrimination of colour go together, although not in exact degree. A high predominance of the two conjoined aptitudes foreshadows a mind of artistic capability, and a strong preference of the concrete to the abstract.

The optical or colour discrimination of the eye is one thing, the discrimination of visible form and magnitude is a different thing. This may be assumed to be the most delicate susceptibility of the human mind. We have not contrived measures of it, so as to distinguish the aptitudes of different persons, and follow out the intellectual consequences of unequal endowment. The Report of your Anthropometric Committee given in at the meeting in 1881 approaches this subject in one form, namely, the perception of test-dots placed at different distances from the eye, and the relation of this perception to age—an important determination for those that have to keep a look-out for signals or distant appearances. But a still more advanced class of experiments is needed to ascertain degrees of retinal delicacy in regard to visible form and magnitude; the avocation of a line-engraver being one that would show the faculty at its utmost stretch.

We want, for the purposes of mental science generally, a set of observations on the *plurality* of the sense of vision, or the number of things that can be simultaneously apprehended, and also the relative delicacy of the impressions on the different parts of field of view, from the centre to the circumference. This inquiry has not yet been prosecuted to its full length for even a single individual, still less can differences in character be expressed; although it would not be difficult to surmise the intellectual bearings of such differences. The problem of the source of our perception of space must centre in this property of vision, as being the ultimate source of our cognition of the absolutely simultaneous, as distinguished from rapid succession or transition, which also makes a part of our notion of co-existing things.

All these determinations are pre-eminently suitable to observation and experiment, and may be given with numerical precision. And in so far as they can be accurately made, the facts of intelligence properly so called can be brought under measurement, instead of being left to the ordinary vague and loose phraseology. The compass of the native susceptibilities of the eye, as regards colour, visible form and magnitude, and simultaneous grasp—is the groundwork of the enormous range and complexity of our acquisitions of sight; such as local memories, memories of persons, and of all the innumerable details of our ordinary experience of the world.

One of the most vital determinations, regarding the intellect, is the relation of memory or retentiveness to the delicacy of the sense concerned. There can be no doubt that we remember best the impressions of our most delicate senses, as sight and hearing. But whether the law that connects the two properties be a simple ratio, or not, only experiment can tell.

This matter, however, needs a still farther advance in the observation of mental facts, namely, the measure of the retentive quality of the intellect, as commonly expressed by memory. Now, this is also a subject well suited to experiment, and a beginning has actually been made in it. The relation of our memory or recollection of a fact to the number of repetitions, and to all other circumstances bearing on the retentive power, has been subjected to numerical determination, and may be pushed to an indefinite degree of accuracy. Such researches are pre-eminently within the scope of this section, being the legitimate following up of Anthropometry to some of its most fertile applications, and having a decided although remote bearing on the solution of the vast problems that first gave form to the section.

The observations now made on measurements of our various sight sensibilities might be paralleled in the sense of hearing, which is singularly open to experiment, with definite results. The musical sensibility, depending on the discrimination of pitch, can be estimated with exactness. You merely test the intervals that the person can distinguish, the fractions of a note, or, it may be, the number of notes that bring out the sense of difference. When you find an individual that cannot distinguish between one pitch and another until the interval amounts to two notes in the scale, as I have actually seen on a trial, you of course pronounce that individual totally incapacitated for music. You can also by the same test ascertain if a child has the degree of natural discrimination that justifies you in setting it to learn the art.

Other qualities of hearing can be measured likewise, by suitable means. As regards articulation, the differences of vowel sounds are very unequally felt, and can be put to an exact test; the bearing on character being still more important. An ear for articulation must enter into the aptitude for picking up languages by the ear, and for the language memory generally.

Farther, the cadence of the voice, which is turned to account in elocution, is equally open to discriminative estimate, and the consequences are of an analogous kind, as regards the endowment of oratorical or declamatory speech.

I will advert to only one other region of sensibility, namely, the muscular, that is, the graduation of degrees of energy, as required for manual dexterity of all kinds. This can be reduced to exact measurement, and was included among the now classical experiments of Weber, on Touch, which paved the way for the subsequent labours of German physiologists on the senses.

I mentioned the possibility of approaching the deeper intellectual powers by experiments on the degree of retentiveness of individual minds. There is another attribute of co-equal importance, and the groundwork of the higher powers of reasoning and imagination, that is, the discovery of agreement in the midst of diversity. The point is not to show that a human being or an animal can recognise an object, as a face, on repetition, but can recognise it under some amount of diversity of accompanying circumstances. An animal

needs to be pretty high in the scale of intelligence to identify the portrait of its master. A series of experiments could be devised to show how far this recognition under difficulty can be carried. The hound of Ulysses is said to have recognised his master, purposely disguised as he was, in addition to the changes in his face in twenty years; while the old nurse hesitated till she saw the scar on his knee.

These observations are the same in kind for animals and for men; and the two series of researches confirm each other. The most profitable of all modes of studying animals is to test the number and acuteness of their sensibility. This is the natural commencement and formation of all precise knowledge, and the first key to the difficulties arising from their anomalous endowments. Sir John Lubbock has taken pains to ascertain the sensibility of sight, hearing, and smell, in the ants and bees, and Mr. Darwin made a point of testing the sense endowments of the earthworm. When we have laid a firm basis in the department of the senses, we can proceed to infer important consequences as regards intellectual power, and divine the bearings on the more inscrutable instincts. No animal can work beyond its powers of discrimination; its selection of one of several courses to pursue requires it to feel the difference between them.

The mode of research grounded on discriminative sensibility, and working up from that according to the best known principles of our intellectual nature, may be contrasted with another mode, which has always been in vogue, namely, finding out and noting any surprising feats that animals can perform, out of all proportion to what we should be led to expect of them. The spirit of such inquiries is rather to defy explanation than to promote it; they delight to nonplus and puzzle the scientific investigator, who is working his way upward by slow steps to the higher mysteries. Before accounting for the exceptional gifts of animals—the geniuses of a tribe—we should be able to probe the average and recurring capabilities. Among the indefatigable experimental labours of Sir John Lubbock was an attempt to teach a dog to read, by making him select cards with writing upon them, to convey his wants. Now, this was a real and genuine experiment, if properly interpreted. The question raised was the dog's power of visual discrimination, as tested by his marking the difference between the different inscriptions on the cards. If the distinction of the words passed his faculty of visual perception of form, the operation was hopeless; if within his visual powers, it became a question of inducing his attention by sufficient motives, and this also revealed a point of character bearing on the docility of animals. Sir John no doubt kept within the bounds of humane treatment; but we know that this difficulty in animal training is too often surmounted by persistent cruelty. The truth is, however, that the ordinary experimenter on the powers of animals of acquisition has been long outdone by the professional exhibitor of their wonderful feats. A canary in Edinburgh offered to read my fortune for a penny. Of course I knew

that the animal was a charlatan, but even to educate it up to this point was no small effort. One of the finest similes in our literature is Dekker's "untamable as flies," but it has been falsified by the perseverance of trainers. Not to quote from recorded examples of the teaching of the common fly, the flea, which I suppose is in a lower place in the intellectual scale, was long exhibited in London as a performer of industrial avocations.

My closing observation relates to the present position of the science of Mind, commonly called Psychology, in the programme of the British Association. Taken as a whole, it is nowhere; it would not properly come into any section. Taken in snatches, it appears in several places; it would come in under Zoology, which embraces all that relates to animals; under Physiology, in connection with the nervous system and the senses; and it figures still more largely, although in an altogether subordinate and scarcely acknowledged fashion, in the section on Anthropology. Indeed, to exclude it from this section would be impossible; man is nothing without his mind.

Now while Zoology and Physiology would keep the study of mind within narrow limits, there is no such narrowness in the present section. In the ample bosom of Anthropology, any really valuable contribution to the science of mind should have a natural place. The subject only needs to be openly named and avowed, instead of coming in by side doors, and indirect approaches.

In saying this much, however, I am quite ready to make allowance for a difficulty. The science of mind, taken in all its compass, raises a number of controversies, which might be well enough in a separate society, but would be very unsuited to the sectional discussions of this Association. The perception of a material world, the origin of our ideas, the mystical union of mind and body, free will, a moral sense—are points that I should exclude from the topics of Anthropology, wide as that department is; and the more so, that it has already on its hands the consideration of matters whose importance depends upon their bearing on far more burning controversies than any of these.

Psychology, however, has now a very large area of neutral information; it possesses materials gathered by the same methods of rigorous observation and induction that are followed in the other sciences. The researches of this section exemplify some of these, as I have endeavoured to point out. If these researches are persisted in, they will go still farther into the heart of Psychology as a science; and the true course will be to welcome all the new experiments for determining mental facts with precision, and to treat Psychology, with the limitations I have named, as an acknowledged member of the section. To this subdivision would then be brought the researches into the brain and nerves that deal with mental function; the experiments on the senses having reference to our sensations; the whole of the present mathematics of man, bodily and mental; the still more advanced inquiries relating to our intelligence; and the nature of emotion, as illustrated by expression, in

the manner of Darwin's famous treatise. Indeed, if you were to admit such a paper as that contributed by Mr. Spencer to the Anthropological Institute, you would commit yourselves to a much farther raid on the ground of Psychology than is implied in such an enumeration as the foregoing.

ANTHROPOLOGY IN 1885.

"In that department of biology which deals with man there has been a good deal of progress during the year. One of the most noteworthy events was Mr. F. Galton's address as President of the Anthropological Section at Aberdeen, in which he summed up the results obtained from the large collection of family records which he was able to make. The same ingenious inquirer's conclusions from the data collected at the International Exhibitions from anthropometric measurements also deserve mention as an important contribution to a science of human character and human action. More striking still are the results of the investigations made by the Rev. Malling Hansen, Principal of the Danish Institution for the Deaf and Dumb, into the laws which govern the growth of the human body during childhood, to which attention was called for the first time in *The Times* of yesterday. Professor Flower's attempt, in his Presidential Address at the Anthropological Institute, to lay down some definite principles for the classification of the human species was much needed, and must have been welcome to anthropologists generally. This Institute has during the past year done an unusual amount of good work under the presidency of Mr. Galton. The papers and subsequent discussion on Jewish ethnology, for example, were of very great interest, as well as, to many, of much novelty. In connection with the many geographical and military expeditions of the past year, our knowledge of outlying peoples has made much progress; while anthropological methods are becoming more and more precise. M. de Mortillet's attempt to establish the existence of man or a precursor of man during the Tertiary period, though perhaps not conclusive, is certainly in the direction favoured by anthropologists of reputation."—*The Times*, January 8, 1886.

THE JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.

NOVEMBER 24TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From R. H. SCOTT, Esq., M.A., F.R.S.—*Acta Societatis Scientiarum Fennicæ*. Vol. XIV.
From the AUTHOR.—*Anthropologische Studien*. By Professor Schaaffhausen.
— *The Races of Britain*. By John Beddoe, M.D., F.R.S.
From the SECRETARY OF THE COMMONWEALTH, MASSACHUSETTS.—
Forty-third Report to the Legislature of Massachusetts, for the year 1884.
From the BERLINER GESELLSCHAFT FÜR ANTHROPOLOGIE.—*Zeitschrift für Ethnologie*. 1885, Heft. 4.
From the INSTITUTION.—*Journal of the Royal United Service Institution*. No. 131.
From the SOCIETY.—*Catalogue of the Library of the Royal Society of Tasmania*.
— *Proceedings of the Society of Antiquaries of London*. Vol. X, No. 2.
— *Proceedings of the Royal Geographical Society*. 1885, November.
— *Journal of the Society of Arts*. Nos. 1720–1722.
— *Journal and Proceedings of the Royal Society of New South Wales for 1884*.

FROM THE SOCIETY.—Transactions and Proceedings of the Royal Society of Victoria. Vol. XXI.

From the EDITOR.—"Nature." Nos. 837, 838.

— "Science." Nos. 143-145.

— Matériaux pour l'Histoire de l'Homme. 1885, Novembre.

The election of the following new members was announced:—

W. SETON KARR, Esq.; E. LAWRENCE, Esq.; Dr. R. MUNRO, and Dr. W. SUMMERHAYES.

Mrs. BENT exhibited a number of Greek Dresses and other objects from the islands to which reference was made in Mr. Theodore Bent's paper on "Insular Greek Customs" (p. 401).

Dr. EDWARD B. TYLOR, F.R.S., exhibited a collection of Tunduns, or bull-roarers, from Australia (p. 422).

Mr. C. H. READ, F.S.A., exhibited a collection of Ethnological Objects from Tierra del Fuego, consisting of models of a canoe and its fittings, bows and arrows in skin quivers, parts of dress, shell necklaces, &c. These specimens were collected from the natives at and around Ushuwia by one of the officers of the South American Missionary Society, and were sent by him to Mr. E. A. Holmsted, a gentleman living in the Falkland Islands. Mr. Holmsted has since presented the series to the British Museum. Mr. Read also exhibited an oil painting by the well-known artist, James Ward, R.A., dated 1815. It represents three views of the head of an African, and was obtained at the sale of the collection of Dr. Barnard Davis, but was unfortunately without any record of the person represented. The picture has been given by Mr. A. W. Franks, to be hung in the Ethnographical Gallery at the British Museum.

EXHIBITION of COMPOSITE PHOTOGRAPHS of SKULLS.

By F. GALTON, Esq., F.R.S., *President.*

THE PRESIDENT exhibited twenty composite photographs of skulls, by Dr. J. S. Billings, of the War Department, Washington. They formed four series, referring respectively to Sandwich Islanders, Ancient Californians, Arapahoe Indians, and Whistitaw Indians. Six skulls of adult males of each of these races had been taken, and a composite had been made of each set of six skulls in the following five positions—front, back, side, top, and bottom. He remarked upon the great skill, from a photographic point of view, shown in making these composites, which were among the very best specimens of composite representation that existed, and he read the following extract from Dr. Billings's letter which accom-

panied the photographs:—"It required much more time than I had anticipated to work out a satisfactory method. I think we are now ready to prepare composites from those crania in our collection which are suitable for such a process. I send you herewith by mail a package of such composites, and also photographs of the craniophore we now use. The adjustments are made by means of vertical and horizontal threads stretched on folding frames, and a full description will appear in the next volume of Transactions of the National Academy of Sciences.

"All are made exactly half the natural size, and after trying several other scales I think this is the one best suited to composite photographs of crania."

The following paper was read by the author:—

On INSULAR GREEK CUSTOMS.

By J. THEODORE BENT, Esq., M.A.

HAVING studied folklore in many parts of Greece, I consider that the islands of the *Ægean* Sea afford the richest field for the collection of genuine customs which have survived from classical days. My reasons for this opinion are as follows:—In the first place, the islands were never, like the mainland, subjected to the incursions of barbarous tribes. This was especially noticeable in the isle of Andros, the most northern of the Cycladic group, and the easiest of access from the mainland by way of Eubœa. To-day the northern portion of Andros is peopled by Albanians. The Greeks to the south of this island are considerably affected by this intermixture, but here the Albanian wave ended, for in none of the other islands is there a trace of this race, which has succeeded in destroying the identity of so many Greeks on the mainland.

In the second place, the Italian influence, which was dominant in the Middle Ages in the islands, has left little trace beyond the towns on the sea-coast. The Latin rule was never popular amongst the Greeks, religious feeling ran high, and each party retained their peculiar customs and their cult. At Naxos, for example, the residence of the Latin dukes of the *Ægean* Sea, the Italian influence is still very marked in the towns by the coast; many Italian-speaking families, remnants of the old *régime*, still live there, but up in the mountains of Naxos there is not a trace of them; the villages are inhabited by Greeks of the most undoubted pedigree.

In the third place, during the Turkish times the smaller islands of the *Ægean* Sea have never been interfered with. Chios, Crete, Samos, &c., have been subjected to severe persecutions;

but the poorer islands, so long as they have paid their annual tribute, have been unmolested and allowed to govern themselves. Refugees from Crete, the Peloponnese, and Asia Minor have come there and settled to avoid Turkish oppression. They have built walled villages on the mountains to protect themselves from pirates, and have maintained their customs undisturbed ever since.

Hence it will be readily seen that the islands, especially the smaller ones, offer unusual facilities for the study of the manners and customs of the Greeks as they are, with a view to comparing them with those of the Greeks as they were. It is a very wide subject, and in my wanderings I have collected a great deal of material. I can only bring before your notice in the space permitted by a paper some of the leading points in connection with it. The following customs have been collected chiefly in the mountain villages and hamlets of the forty islands which during three winters I have visited.

We will begin with the customs concerning the first event in a man's career, namely, his birth. In the island of Karpathos, a remote and rarely visited island lying between Crete and Rhodes, last winter, I watched closely all the customs attending birth and childhood, and amongst many strange innovations I found several which have a distinct pedigree from classical times.

A peasant woman when she has a child calls upon St. Eleutherios to assist her in her troubles. He is the modern representative of the goddess Eileithyia, for gender has not troubled the learned men of the Greek Church, who have distributed the old pagan gods amongst Christian saints; thus the attributes of Demeter have been transferred to St. Demetrios, and those of Artemis to St. Artemidos, regardless of sex.

After the infant's birth it is considered desirable that the handsomest man should be the first to embrace it, so as to impart his beauty, and that the strongest and wisest woman should be the first to suckle the child for a like reason. This idea of imparting beauty and strength is an ancient one, for Herodotus tells us a story of how an ugly girl became the most beautiful in Sparta because her nurse took her to the temple of the heroine Helen, whom they met on the doorstep. And the plot of the *Æthiopians* of Heliodorus turns on the belief that the Queen of the *Æthiopians* became the mother of a white child because she had an image of Hesione before her when the child was born.

We are told by Apollodorus that seven days after the birth of Meleager the Fates told the horologue of the child, and the fire was lighted on the hearth.

There is a ceremony in Karpathos on this seventh day, called in consequence the *εφτά*, which bears a striking analogy to this, when the Fates are supposed to interfere to choose the child's patron saint. The family on this day are assembled, and in the middle of the room they put a large shallow round bowl; if the child is a male they put some of the father's clothes on the bowl; if a girl, some of the mother's, and on the top of them they place the child. For this occasion they have previously made a large wax candle, with seven coats of wax; this they chop into seven equal pieces and put the pieces into candlesticks, which are placed round the bowl, and each candle is called by the name of some saint. The family sit around in silence and prayer until one of the candles is extinguished, and this candle determines the patron saint of the child.

In the evening the bowl is filled with food, boiled barley and water, which is stirred till it becomes the consistency of dough, and into the middle of this they pour honey, and then they sit round to eat. When all this is consumed the doors are closed, more food is put into the bowl, and an old crone is deputed to go round the room to sprinkle it with holy oil, muttering as she does so, "Come, Father of Fates. Come here, Great Destiny, to settle the fortune of this child, that he may have ships, and diamonds, and cattle, and that he may become a prince." At this moment the Fates are supposed to enter the room, eat of the food, and to give good fortune, or *καλομοιράζειν*, to the child.

The Fates of to-day are supposed, as formerly, to be three in number, old women who inhabit inaccessible mountains, and none but people versed in magic know where they dwell. "I shall go to the mountains to call on my Fate" is a common expression of dissatisfaction with destiny. These Fates are always spoken of as spinning, and they preside over the three events of life—birth, marriage, and death. A discontented modern Greek who considers it a misfortune to have been born, a still greater one to be married, and the greatest of all to die, calls them "the three woes of destiny."

After the ceremony of the fate-telling is over the guests take their departure, and as they do so wish the mother a good forty days, that is to say, the forty days before she can go to church after the birth. There is a curious parallel to this custom mentioned in Censorinus, which runs as follows—"In Græcis dies habent quadragesimas insignes namque pregnans ante diem quadragesimam non procedit in fanum."

The days of childhood are associated everywhere in the islands with numerous superstitions, most of them doubtless of ancient date. There are the phylacteries, which they hang round the infant's neck to ward off the evil eye (*βασκαρεία*), fevers, and other

ailments. For many of these diseases they have euphemistic names, like their forefathers. Child's colic is called *τὸ γλυκὺ του*, "its sweet," and minor ailments for which they have no name are politely called "unintentionals," *αμελέτεια*, and small-pox is called *ευλομα*, or praise. Children are supposed to be particularly exposed to those mysterious beings which still haunt the streams and cliffs of insular Greece, and which they call Nereids, and to protect them from the Nereids a Greek mother performs many curious rites. Very often these Nereids are supposed to have children themselves by human fathers: these children are for the most part malicious, evil-disposed urchins, and a frequent term of abuse to use to a naughty child is to say, "Charon must have been your sponsor, and a Nereid your dam." For children who are sickly, and consequently supposed to have been struck by a Nereid, the following cure is much in vogue. A white cloth is spread under the tree or cliff where the spirit is supposed to live. On this are put bread, honey, and other sweets, a bottle of good wine, a knife, a fork, an empty glass, an unburnt candle, and a censer. These things must be brought by an old woman, who utters mystic words and goes away, that the Nereids may eat undisturbed, and that in their good humour, resulting from the food, they may allow the sufferer to regain its strength.

More interesting even than this relic of the offerings the Athenians once made to the Eumenides on the slopes of Areopagus, is another custom which prevails in the islands of Keos, or Zia, for curing children which have been struck by Nereids. In Keos St. Artemidos is the patron saint of these weaklings, and the church dedicated to him is some little way from the town on the hill-slopes; thither a mother will take her child who is afflicted by any mysterious wasting. She then strips off its clothes and puts on new ones blessed by the priest, leaving the old ones as a perquisite to the church, and then, if perchance the child grows strong, she will thank St. Artemidos for the blessing he has vouchsafed, unconscious that by so doing she is perpetuating the archaic worship of Artemis, to whom in classical times were attached the epithets *παιδοῖρόφος*, *κουροῖρόφος*, *φιλομείραξ*. It is curious that on this island of Keos there are many traces of an extensive worship of Artemis, and many images of the fructifying Ephesian Artemis have been found there.

Such are some of the customs respecting birth and childhood which appear to have survived antiquity; let us now take the closing scene of human life, and in the extant customs attending death and burial we shall find many of a like nature.

Charon is as much a personified being in Greece to-day as he was two thousand years ago. Charon is a synonym for death.

"Charon seized him" is a common expression, and a clever popular enigma likens the world to a reservoir full of water, at which Charon, as a wild beast, drinks; but the beast is never satisfied, and the reservoir never exhausted.

Imagination is the soul of the modern Greek death-ballads which hired women sing over the corpses, hired women which remind us of those Carian women who were employed for the same purpose; and on hearing a death wail to-day one's mind is carried back to a Greek chorus, that of *Æschylus*, for example, when the virgins at the gate of *Agamemnon* indulge in poignant grief, beating their breasts and lacerating their cheeks; and on seeing these scenes one realises the wisdom of *Solon*, who forbade women to indulge in this excessive lamentation. The ideas in these ballads are many of them very beautiful. They sing to you of feasts and banquets in *Hades*, where the dead are eaten for food; they tell you of the gardens of *Hades*, where the souls of the departed are planted and come up as weird plants. As an example, I will give you a literal translation of a death-wail I heard last winter in *Karpathos*:—"Charon wished to plant a garden; the aged he planted, and they came up as twisted lemon trees, the young as erect cypresses, and the little children he put as flowers in his vases."

King Charon is not the Death of the Middle Ages, the skeleton with the scythe in his hand; he is the Homeric ferryman; he rows souls across to *Hades* in his caïque; he is a hero of huge stature and flaming eyes of colour like fire (*cf.* *πορφύρεος* in the *Iliad*); he goes round to collect the dead on horseback. So in olden days a horse was the symbol of death, as we see on so many tombstones. Charon, too, can lurk in ambush to surprise his victims, and can change himself into a swallow, like *Athene*, who perched on *Ulysses'* house on the day of the murder of *Penelope's* suitors. Charon's palace in *Hades* is decorated with the bones of the departed, and the dead who haunt it are for ever planning to return to the upper air, and form schemes for so doing which Charon always discovers; sometimes even they manage to steal his keys, but in vain.

There are traces, too, of *Lethe* in modern folklore, as a river of which the dead drink and forget their homes and orphan children, and in animal life there is a parallel case. A shepherd knows of a certain grass on the mountain top, called "the grass of denial," and when flocks eat thereof they forget their young.

Such are the things which these wailing women sing over the corpses. In the mountains of *Naxos*, over the dead body of a baby, I heard the following poetic words:—"To-day the heavens are darkened, the sun is obscured. To-day the child is cut off from his parents. It was not a tree that you could fell it, it was not a

flower that it should fall, but it was a weak young tendril which twined itself around their hearts! Would that I could descend to Hades, and gnash my teeth. For, lo! the worms of the earth to-day have joy. Whenever I think of thee, my darling, whenever my mind ponders on this grief, as a sea I am disturbed, as a wave my mind is troubled!"

In this village they actually retain a trace of the old "obolos for Charon," the freight money. It is only in the name *ναῦλον*, "freight money," which they give to the little wax cross, with *I X N Ἰησοῦς Χριστὸς νικᾷ*, "Jesus Christ conquers," engraved thereon, which is put on the closed lips of the deceased. Thus has Christianity adapted to itself the pagan ritual. In Byzantine times, long after the introduction of Christianity, coins of the Eastern Empire have been found in tombs, placed on the skulls.

Scattered amongst the islands are various customs connected with burial which carry us back into the past. At Seriphos each landowner is buried in a tomb on his own field, built like a little shrine. I never saw this custom in any other island, except Corsica, and it reminded one of the days when an Athenian left in his will instructions that he should be buried in his own land.

In one village of Karpathos they bury their dead in tombs attached to the churches and belonging to various families. In these the body of a defunct member is deposited without any earth, and then allowed to decay, so that a noisome odour is generally the result in hot weather; into the cement at the top of this tomb they insert plates. I asked the reason for this, and none whatsoever could be given; it is evidently a survival of the old feast for the dead, which was laid out in the tombs. It was a curious coincidence that in some ancient tombs which I opened not far from this very village I found the plates thus set out with bones of fishes and traces of other food on them which had been there for over two thousand years.

Many of the ceremonies concerning burial are of ancient origin; there are the *κόλλυβα*, that is to say, boiled wheat, adorned with sugar plums, honey, sesame, basil, &c., which, are presented to the dead. Sometimes they call these *μακάρια*, or blessed cakes, out of euphony no doubt; these *κόλλυβα* are put on the tombs on stated days after the decease, with additional lamentations, and remind one forcibly of the ancient feasts for the dead which were likewise offered on stated days, and the idea of offering boiled wheat is but a survival of that embodied in the story of Demeter and her daughter, and expressed in Christian language by "sown in corruption and raised in incorruption."

Then again the vampire dread is widely extant still in the

isles of Greece, the belief that a wicked man cannot rest after death; they say that if the flesh is not decayed off the bones at the expiration of a year, when they are removed from the tomb to a charnel house, the spirit of the deceased wanders about, and "feeds on his own," as the expression goes, that is to say, he sucks the blood of his relatives, and thereby derives force for his ghostly wanderings. This reminds one of Homer's story that the shades in Hades believed that by filling themselves with blood they could return to life, and consequently eagerly lapped up the blood of slaughtered sheep.

The personification of the mysterious is as vivid to-day with the Greek islanders as ever it was with their forefathers. Charon we have seen as the personification of death. Consumption in like manner is personified in many places, and is called an Erinys, four of whom always stand at the four corners of the room where the patient lies dying, so that they may pounce on those in attendance; consequently consumption is considered by them to be an exceedingly infectious malady.

For every branch of atmospheric phenomena these simple islanders offer explanations of their own, which reflect the colouring of ancient days.

The sun is still to them a giant, like Hyperion, bloodthirsty when tinged with gold. The common saying is that the sun "when he seeks his kingdom (*βασιλεύει ὁ ἥλιος*) expects to find forty loaves prepared for him by his mother to appease his hunger after his long day's journey." Woe to her if these loaves are not ready! the sun eats his brothers, sisters, father and mother in his wrath. "He has been eating his mamma" is said when he rises red of a morning. It is curious to follow out the traces of the worship of Apollo in the modern prophet Elias. Every highest peak in every island is dedicated to this prophet, as of old they were dedicated to Apollo, and *Ηλίας*, Elias, is an obvious transition from *Ηλιος*, for the Eastern Church always tried to combine the ancient name and attributes with the modern worship as nearly as possible.

Prophet Elias is considered to have power over rain; in times of drought people assemble in crowds in his church to pray for rain. When it thunders they say the prophet is driving in his chariot in pursuit of demons.

Pretty allusions to the Dawn are frequent now in popular verse; it is the Virgin who has supplied the place of Eos: she is the mother of the sun; she opens the gates of the east that her son may pass through; and of the all-glorious life-giving sun the modern Greek peasant is extravagantly fond. He is the pattern of perfect beauty; "beautiful as the sun" is a constant expression to describe the beauty of a maiden, and I have heard

an island mother say, "Perhaps the sun will carry a message for me to my child," when she was speaking of her daughter in service somewhere on the mainland. It is the survival of the idea that Sophocles puts into the mouth of the dying Ajax, who appeals to the heavenly body to tell his fate to his old father and his sorrowing spouse. The belief that the sun is in danger when obscured by an eclipse is somewhat exploded now; yet there are those living who well remember the days when people would come out with brass kettles to drive away the evil demons which were threatening the life-giving sun, traces of which custom still survive in songs.

Again, the north wind is a real personage to a Greek islander: *κύρ βορεάς*, Mr. Northwind, as they call him, is a constant and dreaded visitor in winter. He lives, they say, "somewhere up there," pointly vaguely towards Thrace, in a palace of ice and snow; but Mr. Southwind chose to blow one day and melted it all, so that nothing was left but his tears, which flowed down towards the river. In Tenos there exists a legend that the winds live in caves at the north of the island; they tell you how Michael the Archangel once slew two refractory north winds and placed pillars on their tombs, one of which rocks when the north wind blows. What a curious survival this is of the legend of Hercules who slew Zetes and Kalais, sons of Boreas, near this very island, with his arrows, and over their tombs were placed two stelæ, which rocked when Boreas blew!

Again, according to popular belief the twelve months are twelve handsome young brothers, Pallicari, who live together and rule the world in turn; of these brethren, March, the trying month of spring, is represented as the most capricious. During March the mariners dread to go to sea, and the shepherds abstain from going up to the mountains till his reign is over. March, the fickle swain, who dwells with a lovely but crossgrained mistress, and is delighted at her beauty, but grieves at her anger; March, who has deceived his eleven brothers, and for so doing has got a beating; March, who was so angry with an old woman for thinking he was a summer month, that he borrowed a day from his brother February, and froze her and her flocks to death,—all these things, and more besides, a Greek will tell you in order to illustrate the fickleness of this dread month.

Thus do these islanders love to personify what they do not understand in nature. On one occasion our muleteers told us that a certain spot high up in the mountains of Naxos was called the wind's dancing place, *ανεμοχορευπα*; it was a windy, misty day, and suiting the action to the words he began to perform some of the agile figures of the Syrtos dance to show us how he imagined the elements to dance.

Let us now glance at the industrial life of a Greek islander, and we shall come across many traces of antiquity still existing. In connection with the planting of vineyards they have quite a Bacchic festival in many islands. On the numerous feast days of the Virgin, after matins are over, the man who desires to plant a new vineyard calls together fifty or more men, according to the size of the field which he intends to plant. To each man he hands a spade, and then he fills skins with wine, and brings out joints of goat's flesh roasted for the occasion; then the company start off in high glee, singing as they go, and preceded by a standard-bearer holding a white banner. During their intervals of rest they consume the goat and the wine, and then work till the vineyard is planted—for it must all be done in one day—and in the evening they return home with their spades, their hoes, and the wine-skins empty, somewhat the merrier for having imbibed the contents. It is curious in Naxos, the ancient home of the wine-god Dionysos, to find still traces of this god. St. Dionysius, the namesake of the ancient wine-god, is greatly worshipped here, and about him a curious legend is told, clearly pointing to the ancient cult; it runs as follows:—St. Dionysius was on a journey from the monastery on Mount Olympus to Naxos; as he sat down to rest, he saw a pretty plant, which he desired to take, and to protect it from being withered by the sun he put it into the bone of a bird. He went on and was surprised to find that it had sprouted before his next halt, so he put it, bone and all, into the bone of a lion: again the same phenomenon occurred, so he put his treasure into the leg-bone of an ass. On reaching Naxos he found the plant so rooted in the bones that he planted them all, and from this up came a vine with the fruit of which St. Dionysius made the first wine. When he had drunk a little of it he sang like a bird, when he had drunk more he felt as strong as a lion, and when he had drunk too much he became as foolish as an ass. This legend is told in Naxos to-day in an island where place-names still recall the old worship of Dionysius; one of the loftiest mountains is called Koronon, reminding us of the nymph Koronis and the infancy of the wine-god, and an excellent wine made in Naxos is called now *Τοῦ Διονύσου τὸ κρασί*—perhaps the same that Archilochus once likened to the nectar of the gods.

On the adjoining island of Paros a church is dedicated to the "Drunken St. George," an instance of how the modern Greeks still love to deify the coarser passions, and on inquiring into the reason, I was told that on the 3rd of November, the day of the anniversary of St. George's death, the Pariotes usually tap their new-made wine and get drunk; they have a dance and a scene of revelry in front of this church, and this Bacchic orgy

is hallowed by the presence of the priests. Only on one island, Thermia, or the ancient Kythnos, did we find the resinated wine which is commonly drunk on the mainland. Many people imagine this to be a custom derived from an Albanian source, namely, that of covering the inside of the barrels with resin to preserve it. The fact is that Kythniote wine will not keep without it, and we have instances to prove that this is not altogether a modern custom. Plutarch tells us how the ancients put seawater into their wine to give it a flavour, and how the casks were sometimes smeared inside with pitch; the thyrsos of Bacchus had a pine cone at the top of it; and furthermore, that the Eubœans actually did put resin into their wine to flavour it.

In agricultural and pastoral life we have abundant relics of a bygone age. In Karpathos, for example, before the sowing of grain they do this:—The farmer takes a portion of the grain that is to be sown and a rose to church. These are blessed during the liturgy. The rose is broken up and scattered about in the first field which is sown that year as a sure emblem of abundance and success. Thus did the ancients at the festival of *προηρόσαι* before the seed was sown in the ground. In many islands the shepherds wear on their feet sandals of undressed ox-hide, just a flat piece of leather fastened by thongs of the same hide to the feet; they are most comfortable for rough mountain journeys, and identically the same that Homer described. In Amorgos a two-pronged hoe is used for trimming vines, and is called *δίκλα*, an obvious contraction of the same tool which Sophocles described, and called *δίκελλα*. In Karpathos and Keos they have a curious way of preserving grain; holes are dug in the earth near the threshing-floor, and when the grain is ready they put it in, having first been careful to cover the inside with straw; after the grain has been piled up, so as to form a sort of cone-shaped mound, they cover the whole with straw, and place on the top of this some of the stiff native brushwood, and then they cover their mound with earth. Rain never penetrates these granaries, which are now known as *λακκοί*, the classical term for them, *σιρόι*, having been changed, while the custom itself has been preserved. The *φυλακίον* of Aristophanes, a skin for holding the grain necessary for household purposes, exists still; in some places it is called *φλακι*, in others *φλαίς*. In a shepherd's village on Karpathos, where we spent some time, we found many exceedingly interesting words in existence which occur nowhere else in Greece; their mules they term *κῆματα*, or possessions, and do not understand you when you use the usual modern Greek word for mules; their goats they call *χιλία*, or thousands, a truly patriarchal word, pointing to flocks which cannot be counted for number; they

have peculiar words for distinguishing the several kinds of goats and sheep which you find in the pages of Liddell and Scott, but in no glossary of modern Greek words. If a woman wishes to carry a light from one house to the other she puts it into a reed, which here alone have I heard termed *ναρθηκα* or *ναρθηξ*, the same word and the same use for the reed which mythology teaches us Prometheus employed when he brought down fire from heaven.

In their daily life, in their methods of catching fish, in their planting of crops, in their medical and religious lore, endless parallels can be found to antiquity, which prove beyond a doubt that in these islands, remote from civilisation and alien governments, a race of people live of pure Hellenic blood, unadulterated by admixture with other races; they are not numerous, it is true, and for a pure Greek, as for a pure Celt, you must search in mountain villages and unfrequented bye-paths.

APPENDIX by MRS. BENT.

The following is a description of the articles collected during three winters in the Sporades and the Cyclades which I have the honour to lay before the Institute for inspection:—

A figure dressed as a woman of Niseros, in a short narrow dress of white cotton, embroidered round the tail and round the square neck, and with wide sleeves, embroidered in stripes of various coloured silks, and with silver embroidery on the shoulders; over this a very wide dress of turkey-red, half a yard shorter, and sleeveless. A black kerchief across the forehead, and a yellow one over that, hiding the mouth.

A figure dressed as a woman of Karpethos 150 years ago; raw silk embroidered with a wide border in green, dark blue, and red silks, also all round the neck and down to the knees. The sleeves are square, and the pattern mostly a chequer. The dress is 8 or 9 feet long, and a great tuck forms it into a double skirt. Embroidered trousers. Round the waist a silk scarf, embroidered, and on the head, over a black kerchief, a long silk scarf called *bolia* (*midojia*): three or four silver and gilt chains, &c., round the neck, and chains with drops across the brow, also pear-shaped silver-gilt ornaments with glass garnets hooked on the top of the head, with several chains coming down the cheeks, and rings about 4 inches across hanging from them.

Bed valances from Ios, Naxos, and Keos. These consist of a silk embroidered border 6 feet long and a narrower border 10 inches up the sides sewn to a piece of linen, tucked in to the edge of the bed; having originated in the sheet having been adorned to hang over; still called *Sindboni*, or sheets (*Σινδόνι*).

Sindhonia of Karpathos, one cotton and the other silk, and both embroidered very similarly in red and dark green. These are 2 yards deep; 18 inches at the bottom is more handsomely embroidered, and separated from the rest by a gold insertion $1\frac{1}{2}$ inches wide. In this island, where they have no bedsteads, they are used as wall hangings for festive occasions.

A Sindhoni of Niseros worked in brown, light yellow, and blue, and with a pattern resembling that of Karpathos.

Two pillow covers from Karpathos, silk, with green and blue border on both sides, that they may show when the pillows are stored in piles.

Two towels of Karpathos, cotton, with woven coloured ends.

Two silk towels, one with coloured cotton ends, the other gold. All the house linen being hung on the rafters, these smart ones are hung over for show.

A swaddling band from Karpathos, 150 years old, cotton closely worked with black and red silk on the outer end, and with a small sprigged pattern on the rest.

Two towels from Samos with deep lace ends, partly needle and partly pillow.

A cotton hood from Apeirenthos, in Naxos, with a border of blue and red cotton (birds), worn as a coal-heaver wears a sack. Some fine silk pillow lace from Crete.

A sabouna (*Σαμπούνα*), composed of a small pear-shaped gourd as mouthpiece, two reeds (one with a straw in it), and a goat's horn.

A syravlion, or pan-pipe, from Paros.

A whip from Mytilene, wooden handle, chain of twisted iron with four large rings on each link to warn mules of the long knotted thong.

Two rokas, sticks, about a foot long, prettily carved, stuck in the waistband to support the left knitting needle.

An *eikon*, given us in Mykonos to preserve from shipwreck.

A gilded crab-shell, with St. Nicholas, the present "Ruler of the sea," painted in it.

A bank-note, a card $1\frac{1}{4}$ inches square, covered with paper with the name of the Monastery of Spiliane and the signature of Kyrillos, the Prior, who issues them—legal tender in the Turkish island of Niseros. Two worth a penny: from Samos.

A half-drachme piece, pierced, with little blue and white ribbons, Greek colours, tied through: given to friends at a baptism.

DISCUSSION.

Mr. REGINALD STUART POOLE spoke of the great value of Mr. Theodore Bent's researches as a scientific effort to trace the evidence of the continuous existence of the Hellenic race. Such labours were no less valuable than the archaeological explanation which accom-

panied them. In confirmation of the tenacity of the Greeks to their old customs, and the vitality of the race, Mr. Poole cited the remarkable fact observed by Mr. Flinders Petrie in Egypt, that the women of Naucratis, who reminded him of the Hellenic type, went unveiled, whereas the Shemite population of San (Zoan) were unusually strict for Egyptians in the custom of veiling. It was often carelessly alleged by the enemies of a race with great qualities, especially in domestic life, that their loss of the characteristic brightness of the ancient Hellenes was due to a Slav origin, whereas the centuries of Turkish oppression were enough to account for so natural a consequence. It may be added, as another illustration of continuity, that travellers agree in recording the zeal of the Greeks in education, and the care taken to provide schools even in the remotest villages. It is said that Greek girls at Athens, when engaged as servants, frequently stipulate for leave to attend lectures. With respect to the special bearing of the legends of Charon in modern Greece on ancient belief, Mr. Poole thought that Charon's horse might, as Mr. Bent suggested, be connected with the much debated appearance of the horse in Greek sepulchral reliefs.

The following paper was read by the author:—

HISTORY of the GAME of HOP-SCOTCH.

By J. W. CROMBIE, Esq., M.A.

[WITH PLATE XVI.]

It is a notorious fact that children's games are often imitations of the more serious occupations of the grown-up people they see around them, and that a game once introduced is handed down from generation to generation of children long after its original has ceased to exist. Thus children continue to play with bows and arrows though their parents have long ago discarded those weapons; and many innocent-looking children's games conceal strange survivals of past ages and pagan times.

The game of Hop-Scotch¹ is one of considerable antiquity. As it is mentioned in Poor Robin's Almanac for 1667 it must have been a prominent game in England for several centuries; and it has spread over the whole of Europe, appearing under numerous *aliases* in England, Scotland, Ireland, France, Spain, Italy, Sweden, Finland, and other places.

The main features of the game are too familiar to need description. An enclosure is marked off on the ground and

¹ Probably a corruption of *Hop-score*.—Halliwell.

divided into several courts. Through those the player, hopping on one foot, successively kicks a piece of stone, taking care not to touch with his foot any of the division lines, and avoiding certain prescribed courts, till the last one is reached, when he turns and kicks it out again in the same way.

Signor Pitré attributes a solar origin to Hop-Scotch. The stone, he thinks, originally represented the sun, which is kicked through the courts as that luminary passes through the signs of the Zodiac.¹ While Signor Pitré's opinion is entitled to high respect, his theory appears to me quite untenable; for it would require the number of courts into which the figure is divided to be twelve, whereas in no place where the game is played are there twelve main divisions, and very seldom can this number be made up even if subdivisions be reckoned.

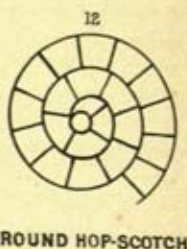
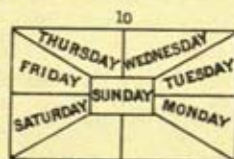
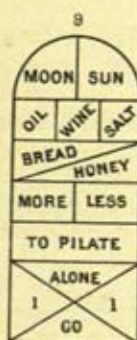
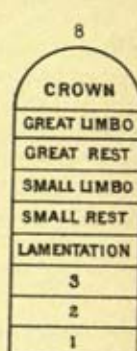
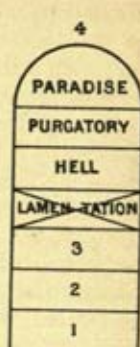
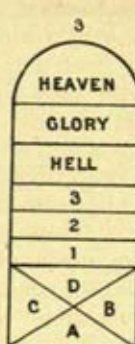
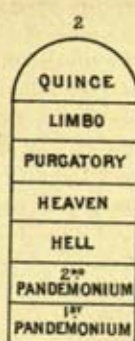
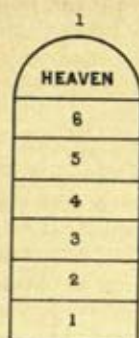
After examining a large number of figures collected from different parts of Europe,² I find that the form of most frequent occurrence, and the one from which all the other varieties appear to have developed, is that of figs. 1 and 2, Plate XVI, where a rectangle is divided into six compartments and crowned by a seventh, and almost invariably semicircular court. This figure is still in use in many parts of Spain, Italy, and Portugal. As they acquired skill, children would very soon wish to render the game a little more difficult by complicating the figure. Thus we find at Venice, though the seven courts of fig. 1 are retained, a vertical line is drawn down the centre of the figure bisecting each court. Again, one court is often split into four by diagonals, as at Fregenal, Spain (fig. 3, Plate XVI), and La Marca, Italy (fig. 4). A figure with seven courts, one of which is split by diagonals, is also used in England.³

"When we wanted a really good game," an Irish lady writes me, after describing the figure used in her youth, "we used to draw all the lines double so as to make more courts." It is by some such process that fig. 8, Plate XVI (used in Mazzara, Italy), has been evolved. This figure contains nine courts, but it will be observed that the names of two courts occur twice, which points strongly to there having been originally only seven. So in fig. 7, used both in France and England, the extra court introduced between that marked *Rest* and *Paradise* appears to be the embodiment of an entirely separate figure

¹ Pitré, "Guiocchi Franchuilleschi," xxxvii.

² The Italian, Spanish, and French varieties of the game are fully described in Pitré, *loc. cit.*; "Bibliotheca de las Tradiciones Populares Españolas," tom. iii; Belèze, "Jeu des Adolescents." For the information as to the method of playing the game in different parts of the British Islands I am indebted to numerous correspondents, especially to Mr. G. H. Kinahan, of the Irish Geological Survey.

³ "Boy's Handy Book of Games" (Ward, Lock & Co.), p. 12.



FIGURES OF THE GAME OF HOP-SCOTCH

(fig. 10, Plate XVI), which will be spoken of presently. On the other hand, we find many variations of the original figure which have gone in the direction of simplification, one or more of the seven courts being omitted. In Llerena, Spain (fig. 5, Plate XVI), there are only six courts, but the analogy of the nomenclature of a number of other Spanish figures points to the third court having been omitted. Similar omissions have produced fig. 6, Plate XVI, used in county Antrim, Ireland, and a number of others in various places. There is thus a considerable body of evidence to show that seven was the original number of courts in the figure. Even the children themselves seem to have been struck by this characteristic, for in several parts of Italy, Spain, and France they have given to the seven courts the names of the seven days of the week, and sometimes called the game itself "the week."

But even in the places where this is done, those names always co-exist with others which are widespread, and evidently very ancient. Although in this country the names of the courts have almost entirely disappeared, we still find the top court called *Paradise*. Now *Paradise*, *Heaven*, *Glory*, *Happiness*, or some such name, is applied to this court with the most striking frequency in every country in which the game is played, the few exceptions being where it has been supplanted by a name alluding to its shape, such as *Quince*, *Calderon*, &c., and even then *Paradise* is generally found in the name of one of the lower courts. In Sicily this court is called *Death*. *Purgatory* or *Hell* occurs almost as frequently as a name for one of the lower courts, and it the player has to scrupulously avoid alighting in. In Limerick the next to the last court is called *Caol*, meaning *Narrow*, or *Hell*; and *Narrow* occurs as a name of one of the courts in several parts of Spain and Italy. *Rest* is also a common name for one of the lower courts, and in it the player has the privilege of reposing for a moment and putting both feet on the ground.¹ *Misery*, *Lamentation*, &c., are found as names for the lower courts in many places, while *Limbo* also occurs with frequency. Let us now trace the course of the player on some of these figures. In England and France (fig. 7, Plate XVI), after traversing four nameless courts and *Rest*, he has to avoid *Hell*, pass through the four triangles (called *Culottes* in France), when at last he reaches *Paradise*. In La Marca, Italy (fig. 4), his course lies through 1st, 2nd, 3rd, when he enters *Lamentation*, and has to pass through *Hell* and *Purgatory*, after which he ends his wanderings in *Paradise*. In

¹ In some parts of Ireland the player, when he reaches the cross courts (fig. 8, Plate XVI), has to stand on one leg till he counts "seven times seven."

Fregenal, Spain (fig. 3), he passes through 1st, 2nd, 3rd *Hell*, and *Glory*, and he finds himself in *Heaven*. In Mazzara, Italy (fig. 8, Plate XVI), 1st, 2nd, 3rd, *Lamentation*, two *Limboes*, and two places of *Rest* have to be traversed before the *Crown* awards his completed labours. But in some places he gets off easier. In Villafranca, Spain, he reaches *Heaven* by passing through 1st, 2nd, 3rd, the *Place of Rest*, and the *Place of Asses*. In Llerena, Spain (fig. 5), it is even smoother sailing. There he enters successively 1st, 2nd, and the *Places of Rest*, then he passes through the *first* and *second quarters of the good*, and he soars into *Glory*. Let us now take the Seville figure (fig. 2, Plate XVI) as an example of a confusion of names. The top court has changed its name to *Quince* (*Gamboa*), and the central court is called *Heaven*. This alteration makes the player's course far less satisfactory, for after passing through 1st *Pandemonium*, 2nd *Pandemonium*, and *Hell*, he suddenly finds himself in *Heaven*, but only to be hurried out of it into *Purgatory* and *Limbo*, and after all he reaches nothing but a place called by the senseless name of *Quince*. The conclusion to which this curious nomenclature points is self-apparent, and when we add to it the fact of the game being called "Paradise" in Italy, and "the Holies" in Scotland, there can be little doubt that in early Christian times the children who played it, whether from their own inventiveness, or at the inspiration of their teachers, had some rough idea of representing the progress of the soul through the future state, and that they divided their figure into seven courts to represent the seven stages of Heaven, which formed a prominent feature in their eschatological beliefs.

It might be objected to this conclusion that it will not explain many names such as those in fig. 9 (used at Malaga, Spain), which is one of the most corrupted I have met with. But the originals of those names are often apparent corruptions of words which accord with the theory;¹ and, considering that they have been handed down for centuries through generations of

¹ I have been careful to select all my illustrations from cases where the meanings of the names were beyond dispute. In fig. 5, Plate XVI, however, there are two further names, *Palajanso* and *Calajanso*, applied to the diagonal courts. My inquiries as to the meaning of those corrupted words have not been successful. The name of the top court in fig. 8 is *Corna* (horn); but I think the analogy of several other figures indicates that this is a corruption of *corona* (crown). As an instance of how the names get corrupted I may mention the word *Plato* (silver), occurring at Dos Hermanas, which is evidently a corruption of *Pilato* (Pilate), frequently used in other Spanish figures. In Zafra, Spain, the penultimate court is called *Gato* (cat). I think that this may possibly be a corruption of the word *Purgatorio* (Purgatory), which is so frequently found elsewhere. To Spanish children this latter word would be a little difficult, and they would catch at the familiar syllable *gato*, just as our own do at *cat* in *catechism*. If this be conceded, the Zafra figure is a very perfect example. The seven courts are all simple, and called 1, 2, 3, *Rest*, *Narrow*, *Purgatory*, *Crown*.

children entirely ignorant of their original intent, and even of their meaning, the wonder is not that they are corrupted, but that they remain so perfect as they actually are. Even in the Malaha figure the names *Sun*, *Moon*, *Pilate*, and the formula at starting, *I go alone*, are not a little suggestive.

There remains to trace the earlier history of the game. Previous to Christianity it obviously cannot have existed in its present form, but games, in order to be as lasting as this has been, must not be invented, but grow. There is reason to believe that Hop-Scotch developed itself from a combination of several ancient games. Julius Pollux speaks of a game played by the ancients where they counted the number of hops which could be made on one foot, but no scores are spoken of.¹ The penalty of ἐφεδρισμός used in connection with an ancient game of marksmanship, and in which the vanquished player had to carry the victor on his back, has also associated itself with Hop-Scotch, and forms part of the game both in Spain and Italy.² It would seem, then, that the game of hopping got wedded to some other game consisting of a figure, some recess of which it was the player's object to reach. Whether this union took place before or after Christianity it is difficult to determine, but certain it is that even now Hop-Scotch is played in many places, both at home and abroad, without any hopping at all, so much so that Sr. Ferraro³ suggests it may be a modification of the ancient game of quoits. We must therefore look for some pre-Christian game with a figure which would supply the remaining features of Hop-Scotch.

Pliny,⁴ in his description of the labyrinths, mentions casually a game played by the Roman boys where they drew labyrinthine figures on the ground. Now, labyrinthine figures are still used for Hop-Scotch, though far less frequently than those of the type already described. Fig. 12 is used in France, the inner circle being called *Paradise*. The same figure is found in England,⁵ and the game played on it called "Round Hop-Scotch," while a less perfect form of it also occurs in Scotland. Fig. 10 (which is not unlike a rough sketch of the Cretan labyrinth) represents another form the game takes in France, the same figure also being used for the game of Marelle. Fig. 11 is perhaps the transition between the two types. It is used at Villafranca, Spain, but a figure conforming to the ordinary type obtains also in that place. It is therefore not unreasonable to suppose

¹ Jul. Poll., "Onomasticon," ix, 7.

² Pitré, "Guicocchi," p. 142; "Tradiciones pop. Espan.," iii, p. 203.

³ "Archivio per lo studio delle tradizioni popolari," p. 246. Palermo, 1882.

⁴ Pliny, xxxvi, 13.

⁵ Crawley, "Manly Games for Boys," p. 79.

that those labyrinthine figures may be survivals of a form of figure more ancient than those of the ordinary type by which they have now been superseded.

Moreover, we know that among the ancients the tradition of the labyrinths was more or less vaguely associated with the future world, and this might have suggested to the Christian children the eschatological ideas which they introduced into the game, even if the difficulties and wanderings of the labyrinth had not in themselves offered sufficient analogy to the wanderings of the soul in a future state. But how came the labyrinthine figure to be exchanged for that of the rectangle with the rounded end? It is well known that when Christianity replaced a pagan culture, it did not destroy, but assimilate. It adopted the stones of the old edifice, but it insisted on hewing them into Christian shapes. I can account for the transition of figure in the game of Hop-Scotch only by suggesting that this principle had been in operation there also. The Christian children, I believe, not only adopted the general idea of the ancient game, converting it into an allegory of Heaven, with Christian beliefs and Christian names; but they Christianised the figure also. They abandoned the heathen labyrinth, and replaced it by a form far more consistent with their ideas of Heaven and future life, the form of the Basilicon, the early Christian Church, dividing it into seven parts as they believed Heaven to be divided, and placing the inmost sanctum of Heaven in the position of the altar, the inmost sanctum of their earthly church.

Explanation of Plate XVI.

Various figures of the game of Hop-Scotch, as played in different countries of Europe.

Figs. 1 and 2 represent forms frequently used in many parts of Italy, Spain, and Portugal; fig. 3 is found at Fregenal, Spain; fig. 4 at La Marca, Italy; fig. 5 at Llerena, Spain; fig. 6 in co. Antrim, Ireland; fig. 7 in France and England; fig. 8 at Mazzara, Italy; fig. 9 at Malaha, Spain; fig. 10 in France; fig. 11 at Villafranca, Spain; and fig. 12 in France and England.

DISCUSSION.

Dr. E. B. TYLOR thought that the author had made out his case that the various forms of the game, especially in the South of Europe, point back to an original game probably in vogue before the Christian Era. In that case, for the source of the seven compartments we may perhaps look back beyond the Christian seven heavens to the seven planetary spheres from which these were derived.

Dr. E. B. TYLOR gave a verbal abstract of the following paper:—

On the MIGRATIONS of the KURNAI ANCESTORS.

By A. W. HOWITT, Esq., F.G.S., Cor. Memb. Anthropol. Inst.

Introductory Note.

It might well be thought an almost impossible task to indicate with any probability of certainty the directions followed by the early Australian tribes during their migrations. Savages keep no records except such as are handed down by word of mouth, and which in the process of transmission become so distorted by age and by imaginations of the transmitters that it is only very rarely that such legendary tales can be recognised as referring to events which probably once happened.

This is the case with the Australian tribes. Of their legends and tales there are but few which can be reasonably believed to relate to past events. Such are the Deluge legend of the Kurnai, Woiworung, and Coast Murring tribes; the Woiworung and Kurnai legend of Loän,¹ and perhaps also the legend of the migration into Gippsland of the "first old man Kurnai."² Such legends as these only throw a dim and doubtful light on some parts of the tribal history, such as their early migrations, and it is in this aspect that I now refer to them.

On this view I have thought it might be well to draft a preliminary memoir, which should have for its general object the broad delineation of some main lines of migration and for its special object the question, "From which stock did the somewhat abnormally developed Kurnai tribe spring?"

I do not propose to consider whence was derived the original stock, the Australian aborigines, but I start from the assumption that their distribution over Australia was from its northern shores, if not from an earlier continental extension still further to the north.

The Migratory Process.

The existing distribution of the class-systems, so far as I have yet been able to collect and compare them, leads me to think that the migrations have not been in an undivided stream advancing in an unbroken front across the continent, but in several streams which spread out on either hand of the main

¹ See p. 416.

² See p. 416.

routes wherever the conditions of water and food were favourable.

In other words, the migration has been diverted into various routes by meeting with obstacles such as waterless tracts or mountain barriers.

It seems to me that the most probable process by which this continent has been peopled has been this. It is reasonable to suppose that whenever a group of the aborigines, who were settled in some favourable spot, became too large for the natural resources of the locality, its younger members would spread outwards in search of new centres, from which in time new departures might again be made. It may, perhaps, be more correct to describe such a process of settlement by saying that from time to time "swarms left the parent hive" to take up a quasi independent existence on their own account, in some favourable locality, either already known to or to be sought out by them.¹

Besides this, which may be called the regular and orderly process of settlement, there must have been also what may be termed the irregular and disorderly process. Intertribal wars would tend to send forth "war-driven" emigrants; broken men escaping from individual or tribal vengeance, and couples who had broken the moral laws of their tribe, would seek safety in flight; and even, perhaps, the wreck of a "totem" may have escaped from a feud which involved it in an unequal strife with a related group far stronger than itself.² Instances illustrative of such causes have been made known to me, and in the past there must have been many fertile but unoccupied tracts into which the guilty or the unfortunate might flee and find a safe refuge from the pursuer. I shall have occasion to point out, when speaking later on of the Bidweli tribe of Eastern Gippsland, that there is evidence that out of such materials new tribes have been formed on the ancient social lines.

Whatever may have been the mode of settlement, there are

¹ According to Taplin, the Narrinyeri had a tradition that their ancestors were led by Nurundere, the Supreme Being, down the Darling and Murray Rivers, and thence east and west along the coast, where they were settled when the white men first arrived. "Native Tribes of South Australia," pp. 3, 55, 61. Wigg, Adelaide, 1879.

² Such a case might have arisen in the Wotjobaluk tribe of the Wimmera River. A "white cockatoo" man had killed one of the "black snake" totem, and according to the tribal custom he had to submit to spear-throwing by the kin of the deceased. He was speared during this ordeal, and, quoting my informant's words, "the old head-man of the Gartchukas (white cockatoo) threw up the piece of lighted bark he was carrying, and the fight ceased." To my question, "Supposing that the Wülnünt (black snake) men had continued their attack, what would have been done?" he replied—"If they had not ceased there would have been a war between all the Gartchukas and all the Wülnünts."

two main lines of march clearly indicated, namely, the eastern and western coast-lines. Others probably lay along the well-watered and generally fertile downs of the great dividing range, and perhaps also followed approximately the direction of the transcontinental telegraph.

Assuming that when the migration began, the physical features of the Australian continent were much as they are now, one line of advance would clearly be indicated as extending southwards from Carpentaria and the country extending eastwards to the sea. So far as the country proved favourable, population would spread, ascending the streams to their sources, and thence descending by other waters flowing on the one hand into the Pacific Ocean, and on the other into the great and arid expanse of Central Australia.

As the streams proceed further from the great dividing range of Queensland into the central depression they become more widely separated from each other by generally waterless and often almost desert tracts, until at length they are lost in the great saline depression in which lie a vast series of salt lakes, such as Lake Eyre.

Still further to the southward where the great dividing range approaches and finally enters into New South Wales, the rivers still flow widely separated from each other by dry tracts, but finally, as the Darling, Lachlan, and Murrumbidgee, contribute to the perennial stream of the river Murray.

Migrations in early times most certainly would extend down such great waters, and would thus become more or less completely isolated from their kindred who occupied adjoining rivers. Thus, in time, well-marked groups of tribes have arisen having certain characteristics in common; usually recognising kindred with each other, and also joining in the same initiation ceremonies. They are distinguished from each other by dialect, by variation of custom, often by variation of initiation ceremonies, and frequently from all other tribes by applying to themselves some special word meaning "man."

Such large groups are recognisable in the better watered parts of Eastern Australia, and even also in Victoria.

I have said just now that such great aggregates of tribes are frequently marked by the use of a common word meaning "man," which is restricted in use to their own males. Thus a very large group of tribes having the Kamilaroi organisation might be spoken of as the "Murri Nation," and this designation would bring them properly into relation with their southern and south-eastern neighbours, who use the word "Murring" or "Murrin" in the same sense. Similarly, a great group of tribes

occupying the country surrounding Lake Eyre, in South Australia, might collectively be spoken of as the "Kurna Nation."¹

In Eastern Victoria there would be found a large "Kulin Nation," and a smaller in the south-west of the colony to which the term "Mara" might be applied.

I suggest that these words signifying "man" may be conveniently used for distinguishing the great tribal aggregates referred to, and in this sense I use them in this paper.

My preceding remarks will have shown my views as to the general process of migration. A few more are now necessary before I proceed to consider of which migratory stream the Kurnai ancestors were most likely an offshoot.

One stream of settlement seems to have followed down the waters which unite to form the Darling, and to have thence traced the Murray River from the junction of the two, until, reaching the sea-coast, it spread east and west along it.

Its eastern termination may perhaps be recognised in the Mara Nation, which in Victoria coalesced with the Kulin, somewhere, so far as I can make out, about the southern slopes of the Grampian Mountains, and more to the east about Colac.²

Another stream which had followed the well-watered country southwards from the sources of the Darling River seems to have divided when meeting with the great block of mountains of which the Australian Alps are the culminating points. These people spread round the northern and western flanks of the mountains into Victoria, where they are represented by the Kulin Nation, whose termination in the south was in the Bun-wurung tribe, in the extreme south-eastern part of the Western Port District. The Kulin seem to have occupied all the flanks of the mountains from the Ovens River to Cape Patterson, and westwards as far as Geelong, Ballarat, and the sources of the Richardson River. Another branch of the same stream flowed round the eastern flanks of the mountains on to the Maneroo tableland, and down the southern coast of New South Wales, where as one of the Katungal tribes it formed, near Towfold Bay

¹ The *Kurnai Tribe* of Gippsland must be distinguished from the *Kurna Nation* of the Barcoo Delta. The term "Nation" which I now use must be understood as meaning no more than an aggregate of kindred tribes, without implying any kind of confederacy between them. I take this opportunity of pointing out that there is no warrant for the use, which I have observed, of the word *Murri* or *Murray*, as meaning "Australian aborigine." There is no word in the native languages having that meaning. Such words as *Murri*, *Kulin*, *Kurnai*, *Mara*, have a strictly local meaning. A male aborigine of Victoria is no more a "Murri" than a Scot is a Welshman.

² The Narrinyeri tradition quoted by Taplin ("*Native Tribes of South Australia*," p. 61) says: "Nurundere . . . led his sons, i.e., his tribe, down the southern shore of the Lakes, and there turned up the Coorong. There he appears to have met another tribe coming from the south-east."

and Cape Howe, the extreme south-western termination of the great Murri (or Murring) Nation.

Between the south-eastern termination of the Kulin Nation, at about the Tarwin River in South-west Gippsland and the south-western termination of the Murri Nation at about Malla-goota Inlet in Eastern Gippsland, there was the Kurnai tribe. This remarkable tribe can be shown to be neither Kulin nor Murring, and an inquiry now arises of which of the advancing lines to which those people respectively belong it has been an offshoot. In seeking for a reply to this question, I have met with some curious facts which are worthy of notice.

The Kurnai Ancestors.

The Kurnai acknowledge no kindred with any of the tribes adjoining them. In olden times they were hostile to all, and applied to them a name as distinguished from themselves of "Wild men." It is therefore necessary, in attempting to trace out from which migratory stream of those I have mentioned the Kurnai ancestors were derived, to turn to the customs and the beliefs of the tribes for light.

I am not in a position to compare the languages of these tribes in a satisfactory manner, for to do this it would require one to have a competent knowledge of the languages of at least three of the tribes adjoining the Kurnai country. Besides this, it would also be necessary to have a good acquaintance with the three Kurnai dialects, the Mük-thang, the Thang-quai, and the Nūlit, of which the former only is familiar to me. It is therefore necessary to have recourse to the aid to be derived from the comparison of vocabularies, and of such slight knowledge of the neighbouring Murring languages as I have obtained.

The result has been to prove that the Kurnai dialects are most nearly allied to those of the Kulin, and differ as much on the other hand from those of the Murring, both of the coast and of the mountains. Yet I must also note that the Thang-quai, as spoken by the most easterly of the Kurnai, namely, the Krauatun, has words which are no doubt due to the intimate relations of this clan with its Murring neighbours.

The customs of the various tribes do not in comparison afford much light, but what little there is shows a greater resemblance in details between those of the Kurnai and Kulin than between those of the Kurnai and Murring.

Two illustrations will suffice as examples of this part of the evidence. As I have elsewhere shown, the Kurnai Jeraeil has no resemblance to the Murring Kuringal, excepting in the first

principles which underlie both. The Jibauk of the Kulin were probably the survival of more complete ceremonies, which, if resembling either of the others, did so more as to the Jeraeil than as to the Kuringal.

The practice of sending messengers was common to all the tribes, but the practice of the Kurnai and Kulin agreed most, even to the name applied to the messenger,¹ and to the method of enumerating the number of camping stages to which the message might refer.

This resemblance is still further and more strongly supported by a comparison of the local organisation of the tribes, as I have now evidence to show. The imperfect remains of the class-systems of the Wolgal, Ngarego, and Coast Murring point to a derivation of their social organisation from systems of the Kamilaroi type. Indeed, that of the Wolgal preserves two of the four classes in precisely the form of name which still obtains in the neighbouring Wiraijuri tribe. Nothing in these systems throws any light upon the mere traces of the class organisation which the Kurnai have retained.

On turning to the Kulin tribes, however, the case is very different. The very names of the two primary classes suggest an explanation of the peculiar designation which is applied to many of the Kurnai men when reaching mature age. In explaining this, and in illustrating the comparisons possible, I must now note a few facts as to the Kulin, and for this I use the Woiworung tribe, which is indeed the only one as to which anything like complete data are now obtainable.

In all the tribes of the Kulin Nation which were settled in the country extending from the Upper Goulburn River southwards to the sea-coast in the Western Port District, there obtained a class system having only two main divisions with totems. Together with agnatic descent there was this peculiarity, that each local division consisted only of men of one or other of the two class-names, the wives of these men being all, of course, of the other class, and the children all of the class to which their fathers belonged. Thus it was that each local division was perpetuated by men of the same class-name. The people who spoke the Woiworung language afford an illustration. They were divided into five clans, one of which, the *Ūrūnjéri-Balūk*,² claimed the country lying between the Yarra and Saltwater Rivers, and it is to this clan that my information particularly refers. All the people of *Urunjeri* descent were of the *Waa* (Crow) class. Of the other four clans, two were likewise *Waa*

¹ *Paiaara* with the Kurnai, and *Baiaur* with the Kulin.

² *Urun* = white gum-tree; *baluk* = a number of people.

and two were Bunjil (Eaglehawk). The class system of this tribe, as I have said, has these two primary class divisions Eaglehawk and Crow. In addition to these, there is one totem, Hawk, which belongs to Bunjil, while Waa has not any totems. The folklore of this tribe, however, has a more complete list of the totems of Bunjil. A legend relates that long ago, "in the beginning," the great Supreme Being, Bunjil, lived on the earth with his sons, Thara (Hawk), Yūkope (Musk Lorikeet), Jūrt-jurt (Nankeen Kestrel), Dantūn (Blue Mountain Lorikeet), Turnūng (Brushtailed Phascogale). Bunjil being at feud with Balaiaṅg (the Bat), sent his sons to burn all the country towards the Murray River, and in this conflagration the Bat was scorched so that he has remained bare and grinning ever since. This enterprise having been successfully accomplished, Bunjil and his "sons" ascended to the sky, where they now are as stars.¹ We may, I think, surmise from this legend that the "sons of Bunjil" represent the totems formerly existing in that class. I have not learned any corresponding legend as to the "sons" of Waa.

Now it is to be noted that with the Kurnai the term Bunjil has no significance as "Eaglehawk," but is a name which is applied to many old men, in conjunction with some term expressing some characteristic or quality. For instance, an old man who had a deep growling voice became known as Bunjil Gworūn (thunder). The crow is regarded by the Kurnai as being one of the "Muk-Kurnai," or ancestors, and they reverence it, and think that it watches over them and can answer their questions by its cawing (*Ngā*, Yes; or *Ngat-bun*, No). As the Kurnai have no true totems, it is not possible to make a satisfactory comparison, but it is not perhaps without significance that one of the Woiworung "sons of Bunjil" (the Brushtailed Phascogale) is called by the Kurnai in the Nūlit language, Bunjil wadtun, that is to say, "Bunjil opossum." The Hawk, which is one of Bunjil's sons, and also the sole remaining totem of that class, also appears in the Kurnai folklore as a Muk-Kurnai, who prevented the supernatural female "duality," Būlūm-Baukan, from stealing the fire of the Kurnai.²

I have elsewhere noted the peculiar bird totems of the Kurnai

¹ Among the Wotjo-balluk of the Wimmera River, in North-western Victoria, Bunjil is a sub-totem of the Gárchūka totem of the Krókitch class. It is related that long ago he was a very powerful man who ascended to the sky with his two wives, who were sisters, Gēnawara (swan), of the class Gámūtch.

² I use this word "duality" as the only one I can think of which expresses the peculiar conception of the supernatural being "Bulum-baukan." Two Baukans are always spoken of, but at the same time as if inseparable, and having one son, "Bulum-tut," common to both. Baukan is in some respects analogous to the Ngalaibal of the Murring Kuringal ceremonies, to the two wives of Bunjil, of Baiame, &c.

which divide the community into a group of males and a group of females. But these totems are not of a kind peculiar to this tribe, for I find them throughout South-eastern Australia, and they probably have a wider range. They are not true totems in the sense that these represent subdivisions of the primary classes, yet they are true totems in so far that they are regarded as being the "brothers" or "sisters" of the human beings who bear their names. I cannot now enter into a further consideration of the very interesting subject of Australian totems, which requires a separate memoir for its treatment, but must confine myself to such facts as have a bearing upon the questions with which I am at present concerned.

The bird totems of the Kurnai are the Emu wren and the Superb Warbler, which are respectively the "man's brother" and "woman's sister." With the Coast Murring the Emu wren is also the "man's brother," but the "woman's sister" is the Tree creeper (*Climacteris scandens*), and this is the only totemic connection which I can trace out between these tribes. When, however, we turn to the Kulin we find both the Kurnai totems in just the same position. In addition, there are also a second male and female totem, namely, the Bat and the small Nightjar, and these two are found to extend to the extreme north-western confines of Victoria as the "man's brother" and the "woman's sister."¹

In the Woiworung language the Emu wren is called "Bunjil Bóroin," and possibly this may have a connection with the legend of the Kurnai "Adam"—for it is related that the "first Kurnai old man," Bunjil Borun, walked across the plains from the north to the sea, carrying his wife in a canoe on his head. I feel a difficulty in connecting the two names, as in the Kurnai dialects Borun means "Pelican," and not "Emu wren."

There is another legend, however, which is found in what I may call its complementary parts in the Woiworung and Kurnai tribes, and to me it seems to speak of an early migration of the Kurnai ancestors in unmistakable terms.

The Woiworung say that long ago a gigantic being like a blackfellow lived on the banks of the Yarra River. He was named Loän, and is now pointed out as one of the stars. Observing that pieces of swan's-down were carried to the Yarra by the south-east wind he journeyed in that direction and discovered the Inlets at Western Port Bay, where he settled down for a time. By-and-by he again wandered onwards, following the swans in their migrations, and thus discovered Corner Inlet in

¹ Mr. A. L. P. Cameron has shown that these totems extend still further into New South Wales.

Gippsland, where he permanently took up his abode, living in the mountainous recesses of Wilson's Promontory.

The Kurnai on their part say that a great being called Loän lives in a cave at Wilson's Promontory, where he has at times been seen wandering armed with an enormous spear.¹

It is to this Loän that is attributed the institution of the remarkable formalities which attended the admission of alien but friendly blackfellows into his country. By the Kulin of Western Port and Melbourne, and by the Kurnai, the country for some distance on each side of Wilson's Promontory was known as "the Bad ground."² It was believed that any blackfellow other than a native of it who should enter it, without being under the charge of a Brataua man and the protection of the proper formalities, would certainly become ill, and most likely die.

From what I have heard of this belief, and of the formalities connected with it, I suspect that at the bottom lies the liability to some kind of fever by blacks from warmer and dryer parts of the country if they come and camp in the damp and swampy forests of the "Bad ground."³

The legend of Loän and the belief in the "Bad ground" connect the Kulin and Kurnai tribes and strengthen the views suggested by the class-names. It seems to me more than probable that the Kurnai are of the same stock as the Woiworung Kulin, and that the legends which I have noted refer to one, if not more than one, immigration into Gippsland; one migration by way of Western Port, and another, if the story of the Kurnai "first old man" has any reference to the facts of the past, by way of the Macallister River valley, which even since the whites have settled in the country has been the war-path of the Kurnai when making a raid upon the Kulin of the Mansfield district.⁴

It is now well to consider what were the relations of the Kurnai with their immediate neighbours to the east, that is to

¹ The name Loän seems properly to belong to the Brataua Kurnai clan, which, living in his country, were supposed to be protected by him. The other Kurnai knew of him from them, but also spoke of him by the name of "Kälängäuk." Both these names are applied to white men, and white women have received the designation of the wife of Loän, namely, Loän-tüka. Old men tell me that these names have been used for the supernatural being in the Brataua country "from the beginning," that is, the origin of these names is unknown to them.

² In the Nulit dialect = Wia-wek; in the Woiworung = Márine-bek.

³ Mr. James McAlpine, who has lived in South Gippsland almost since its settlement, tells me that when he first came there he became acquainted with a very old blackfellow who gave him much information, and who said that "his fathers came from the West, and the country to the East was at that time empty of people."

⁴ These Kulin were also divided into Bunjil and Waa.

say, with the Coast Murring. The language spoken by the Krauatun, who were the most easterly clan, was a dialect of the Kurnai language, and was quite unintelligible to the adjoining Murring.¹ Yet there are a few peculiarities which show that the language of the latter has influenced it.

The Krauatun Kurnai occupied the country along the coast from near Lake Tyers eastward to Mallagoota Inlet. The Tatung Kurnai extended along the strip of country westwards from the entrance to the Gippsland Lakes, and between them and the sea. The full names of these two clans are Krauatung-galung and Tatunggalung. The termination "galung" is a possessive suffix which slightly differs from the form which I find in the Mukthang, where it is "lung," as in the clan name Brabralung, which may be translated as "manly," or "belonging to that which is manly;" another example is in the possessive pronoun *ngitalung*, = "mine," which is properly and in full, when not colloquially abbreviated, *ngaiw-ta-lung*, that is to say, "I, belonging to," or "of." In the termination "galung" I find a common possessive suffix of the Murring language, "gal," added to that used in the Mukthang. As examples of the use of "gal" I take the local names of the Coast Murring tribes as "Bemerin-gal" and "Katun-gal," where Bemerin = Mountains, and Katun = Sea. The term Katungal, as meaning those "of" or "belonging to" the sea coast, is applied by the Murring to all those thus located on each side of them, in one direction into Gippsland, and in the other beyond Sydney. I cannot but think that the name Tatunggalung of the Kurnai is in fact this word with the "K" altered to "T," and the Kurnai possessive suffix added.

The word "Tat" is by them used as meaning "south." Hence a southerly rain is "Tátung-willung," but there is a second word in use also meaning "south," namely "káter." This, I think, is merely a variation of the same root.

The Krauatun consider themselves to be, and are recognised by the other clans as, Kurnai. But they do not participate in the Jeraeil of their own tribe, nor in the Kuringal of the Murring, except in rare cases, such as where a man's mother belonged to that tribe, and he might be admitted to what may be called an "honorary membership." The Tatung had con-

¹ There were three dialects in Gippsland—the Nulit, spoken by the Braiaka and Brataua; the Múk-thang, by the Brabra; and the Thang-quai, by the Krauatun and Tatung. The difference between these three dialects and the Murring language can be shown by the statement which a Krauatun man might make. He would probably say, "I can understand the Múk-thang, and speak it a little; I can understand the Nulit, though I cannot speak it; but I cannot understand the Murring language at all."

nubium only with the other clans of the Kurnai. The Krauatun had this, but also in addition with the Murring.

This connubium, existing between the Krauatun, Kurnai, and the Coast Murring, leads to an interesting conclusion. It was not the alliance of two local divisions of the same tribe, but of divisions of two totally distinct tribes. It shows that even when two groups such as these met in the past as complete strangers to each other, permanent hostility was not necessarily the consequence. It even suggests that unless impassable natural barriers intervened between tribes, their outlying members would be sure to become more or less connected by the bonds of acquaintance and of kindred formed by inter-marriage. This would, it seems to me, be the case even when two tribes were, as entities, in a chronic state of feud with each other.

Who can say, or even conjecture, how long the two migratory streams had been separated when in olden times the ancestors of the Kurnai and of the Murring met first at Mallagoota Inlet? It is not possible to say, but the period must have been sufficiently long to admit of their customs having diverged, the initiation ceremonies of one branch having been lost, and of their languages having become mutually unintelligible. Yet, in spite of all this, we find the two migrations not only on as friendly a footing with each other as were the Kurnai clans to each other, but also in some respects having undergone a partial fusion.

On the grounds I have now stated, it seems to me almost if not quite clear that the Kurnai ancestors entered into Gippsland from the westward, or perhaps also from the north-westward, in one or in more than one migration.

The Bidweli Tribe.

The discussion of the preceding questions brings into view a subject of much interest, namely, the Bidweli tribe.¹

Between the country of the Krauatun Kurnai at the Snowy River and along the coast, and that of the Murring of the Maneroo tableland to the north and of the sea coast Murring to the east, there lies a large stretch of country which was occupied by the now almost extinct Bidweli tribe. This tract is one of the most inhospitable that I have seen in Australia. I have traversed its scrubs, mountains, and swamps four several times, and I observed little in it of living creatures excepting a few wallaby, snakes, leeches, mosquitoes, and flies. Yet the Bidweli inhabited the few small open tracts in it and called themselves "men" (*maap*).

¹ Sometimes spoken of as the Bidwel, or Bidwelk. I cannot give any translation of this word.

After lengthened inquiries from the few survivors, and from those of their neighbours who knew them, I have ascertained as follows:—

Their language is compounded from the surrounding dialects. The class-names and totems are similarly derived from their neighbours, for I have found them to be Yeerung (Krauatun Kurnai), Yūkembrük = Crow, and Tchūteba = Rabbit Rat (Ngarego), and Yalonga = Rock Wallaby (Coast Murring). I even found one family bearing the name of Bunjil. Their relationship terms are also derived from the same neighbouring tribes, some being Kurnai and some Murring, as might have been forecast from their compound language. Further, the Bidweli had no initiation ceremonies, and the last survivors are not, as I have observed, even admitted to those of the neighbouring tribes with whom there was connubium. This *prima facie* case of a mixed descent is strengthened by the case of a Bidweli man claiming as his country the upper valley of the Brodribb River.¹ He stated to me that his "father's father" was a Kurnai of Buchan² who left his country and settled in the small open tract known as the Goungra Valley, west of Mount Ellery. His son obtained a wife from the Thedora of Omeo, and the son of this marriage, my informant, married a Ngarego woman. This pedigree accounts for both Yeerung and Yukembruk.

Such a case as this of my informant's grandfather is just on all fours with one mentioned by me elsewhere³ of a man who, having broken the moral law of his tribe, escaped out of reach of its vengeance, and only reappeared when the whites had settled the country, and he could thus find protection against tribal vengeance.

I can feel no doubt that the Bidweli country has been an Australian "Cave of Adullam," and that its tribe has been built up by the refugees from tribal justice or individual vengeance, who have organised themselves so far as they could do so on the old accustomed lines. It is a good example of what Dr. Hearn has called the formation of a non-genealogical tribe.

The general conclusions which may be drawn from preceding statements are these:—

¹ So far as I can learn, it was only about fifteen years back that this man "came in," that is to say, abandoned his wild life and went to live among the stations of the Maneroo tableland. He was the last wild blackfellow in Gippsland.

² This is not, as might be supposed, a Scotch name given to the locality by some of the early settlers, who were mostly from North Britain, but a native word, which should be properly written Būkan, meaning the large net-bag in which the blackfellows carried their things. The proper name of the place is Būkan-mūnji, meaning "Bag-there," or the "Place of the Bag."

³ "Kamilaroi and Kurnai," p. 348, footnote.

- (1) The early aborigines of Australia in spreading southwards over the continent followed the well-watered tracts along the coasts and the rivers.
- (2) The spreading population gradually became separated into groups of tribes having certain common features, one of which, namely, the use of a word meaning "man," conveniently affords a means of marking the extent of such of these groups as may be termed "nations."
- (3) Where migratory streams again met, the tribes which formed their extreme terminations coalesced and established connubium, in spite of difference in custom and language.
- (4) The Kurnai tribe is an offshoot from such a migratory stream which spread round the northern and western flanks of the Australian Alps, and penetrated to Gippsland in two or more immigrations.
- (5) Tribes have been formed not only by the regular process of growth of groups separated from genealogical tribes, but also by the organisation on the accustomed lines of aggregates of "broken men."

DISCUSSION.

Dr. E. B. TYLOR, in calling attention to the chief points of Mr. Howitt's argument on the ancestry and former home of the Kurnai tribe, remarked that the anthropological interest attaching to this tribe, which induced Mr. Howitt to study in such detail the traces of its past movements, depends on its illustrating a remarkable course of social change. While the neighbouring tribes follow the ordinary Australian matriarchal rule of female descent, and are divided into intermarrying classes, the Kurnai have as to males the rule of male descent, and marry into different divisions within the tribe. Their peculiar marriage-custom, however, gives reason to suppose that exogamous marriage-classes, comparable with those of the Kamilaroi, once existed among them. Couples elope together, and though this is the only mode of marriage the parties are pursued and punished as offenders, till eventually the crime is condoned and the married pairs settle into the tribe. This is fairly explained by considering the Kurnai to represent one intermarrying body whose corresponding body has been destroyed or separated, so that they are now compelled to violate the law of exogamy, though they do so under ceremonial protest. At the same time they have made some part of the transition from the matriarchal to the patriarchal system. These are changes of such importance in social development, that Mr. Howitt rightly judges it worth while to ascertain

the historical circumstances under which, in this particular case, they have come to pass. Referring to Mr. Howitt's paper on the initiation ceremonies of the Kurnai ("Journ. Anthropol. Inst.," Vol. XIV, p. 301), Dr. Tylor produced specimens of the sacred *tundun*, or "bull-roarer," sent over to him by Mr. Howitt, and whirled them to show the difference between the deep tone of the larger or "man tundun" (Grandfather) and the weaker shrill tone of the small "woman tundun." Illustrative of the horror felt by the natives lest these sacred instruments should be seen by women or children, is the myth current in this region of a deluge caused by some children finding a tundun which had been hidden in a bush, and bringing it home to their mothers, whereupon the sea burst out over the land. After displaying the remarkable mechanical action of the bull-roarer, Dr. Tylor noticed its wide prevalence in religious mysteries, as where in front of the Moqui procession of dancers, each with a live rattlesnake or two in his mouth, the priest walks whirling a bull-roarer, much as Mr. Andrew Lang has shown the ancient Greeks in the mysteries of Dionysos Zagreus to have whirled their *pouβov*, which the description shows plainly to have been a bull-roarer. This word itself is good local English, belonging to the flat slip of wood fastened at the end to a string which represents in European boys' play the instrument which has had so high a mystic import in the barbaric and ancient world.

DECEMBER 8TH, 1885.

FRANCIS GALTON, Esq., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From H. H. PRINCE ROLAND BONAPARTE.—A Collection of Photographs of New Caledonians and Australian Natives (Queensland).

From H. W. SETON KARR, Esq.—Photographs of North American Indians.

From the SMITHSONIAN INSTITUTION.—Annual Report for 1883.

From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE.—Correspondenz-Blatt. October, 1885.

- From the SOCIEDADE DE GEOGRAPHIA DE LISBOA.—Subsídios para a Historia de Jornalismo nas Provincias ultramarinas Portuguezas. Pelo Socio Brito Aranha.
- From the AUTHOR.—Ueber Bekleidung, Schmuck und Tätowirung der Papuas der Südostküste von Neu-Guinea, von Dr. Otto Finsch.
- An Address before the Section of Anthropology of the American Association for the Advancement of Science, at Ann Arbor, August, 1885. By William H. Dall.
- From the ACADEMY.—Atti della Reale Accademia dei Lincei. Serie quarta. Vol. I, Fas. 24.
- From the SOCIETY.—Journal of the Society of Arts. Nos. 1723, 1724.
- Proceedings of the Royal Geographical Society. December, 1885.
- Journal of the China Branch of the Royal Asiatic Society. 1885, No. 3.
- Boletim da Sociedade de Geographia de Lisboa. 5ª Serie, No. 5.
- Mittheilungen der Anthropologischen Gesellschaft in Wien. XV Band., Heft 1.
- From the EDITOR.—"Nature." Nos. 839, 840.
- "Science." No. 146.
- L'Homme. No. 20.
- Bullettino di Paletnologia Italiana. Serie II, Tom. I, N. 9 e 10.

Mr. H. H. JOHNSTON exhibited and described a collection of photographs of African Natives, upon which Professor Flower made some remarks.

Mr. H. W. SETON KARR exhibited and described some photographs of North American Indians.

Mr. JOSEPH HATTON exhibited a number of ethnological objects from North Borneo, collected by his son, the late Mr. F. Hatton.

Mr. W. M. CROCKER exhibited and described some objects from Borneo, and made some observations on Mr. Hatton's exhibit.

Miss MAN exhibited a collection of photographs of Nicobarese taken by her brother, Mr. E. H. Man.

Professor R. MELDOLA exhibited and described some photographs of Nicobarese.

EXHIBITION of PHOTOGRAPHS of NORTH AMERICAN INDIANS.
By H. W. SETON KARR, Esq.

THESE photographs are mainly of an Indian tribe called by the French Canadians *Montagnais*, though why is not clear, the only mountains they inhabit or visit for purposes of trapping furs being part of the Laurentides, which at that particular point are by no means lofty. This tribe inhabits the country north of Quebec, in the vicinity of Lake St. John and Lake Mistassini, and the Mistassini, Ashoupmouchouan and Peribonca Rivers.

Unlike the American tribe of Indians in New Mexico, the Montagnais are quite ready, and even eager, to submit to being photographed. In Mexico and Arizona they are sometimes bribed to stand, but often hide their faces just as the cap is removed from the lens of the camera.

These Montagnais, according to the Hudson Bay officers at Blue Point, are rapidly dying out, from unaccustomed food and change in their habits, owing to the lack of game, and the necessity of their taking up agricultural or at least industrial pursuits in order to make a living with any certainty.

I heard them coughing, and was informed that phthisis and pulmonary affections chiefly carried them off.

Although this tribe is dying out (which is a relic of the famous Iroquois tribe), other Indians are by no means doing so, as the statistics show.

Thus the population of Indians in Quebec Province	
in 1871 was	8,657
" 1883 "	11,930
" 1884 "	12,023

The Indian Industrial Exhibition near Quebec in 1884 was wonderfully successful.

Indians in Canada now have quasi-municipal privileges and a separate Department of State for the management of their affairs.

EXHIBITION of ETHNOLOGICAL OBJECTS from BORNEO.
By W. M. CROCKER, Esq.

THE inhabitants of Borneo consist of Mohammedan Malays on the sea coast, and numerous aboriginal tribes in the interior: these are divided into some hundreds of families or small tribes, but so great a resemblance do they bear to the Malays that they are undoubtedly equally the offspring of the great Polynesian race.

I shall not attempt to enter into the theory of the origin of

these people, but I may remark that some writers say they came originally from the West (Java and Sumatra) and the remains of Hinduism, such as stone-shaped balls and other stone utensils, found amongst them, would seem to support this theory. At the mouth of the Sarawak River, for instance, many articles of gold and pottery of unmistakable Hindu workmanship have continually been found, indicating that this was once the site of an important Hindu settlement. Mr. Carl Bock, who travelled from Coti, on the east coast of Borneo, to Banjer on the south, found numerous Hindu remains amongst the natives of the interior. Mr. Wallace is of opinion that Borneo once formed a part of the mainland of Asia, and that it was originally peopled from the north. Curiously enough I found the belief in good and evil spirits existing amongst the Milanows of the north-west coast of Borneo exactly similar to that found amongst the Cochin Chinese, and there are not wanting other evidences in support of Mr. Wallace's theory. But we have more to do with the curious and striking customs found amongst the people. When residing on the north-west coast amongst the Melanows I made a vocabulary of some fourteen different tribes, and although in many instances before they came under the influence of a settled government, the people of one river could not converse with those of another, yet the similarity of language is so great that it proves unmistakably that all these tribes are branches of one great family; and yet their manners and customs are in some instances so different that one is almost led to doubt whether this inference is a correct one. For instance, in one tribe only I found the parents flattened the heads of their children; I believe this practice is confined entirely to the Milanows.

It is considered a sign of beauty to have a flat forehead, and although chiefly practised on female children, boys are occasionally treated in the same manner. When a child is a few days old an instrument (shown at the meeting) is applied to the forehead, a small cushion being placed underneath, and under that again some green banana leaves. By an ingenious arrangement of strings equal pressure is brought to bear on the forehead, and the final tightening is done in front by a contrivance which has the same effect as a tourniquet. I have often watched the tender solicitude of the mother who has eased and tightened the instrument twenty times in an hour, as the child showed signs of suffering. The chief object is to get the child to sleep with the proper amount of pressure on the instrument. Before the child is twelve months old the desired effect is generally produced, and is not altogether displeasing, as it is not done to the extent of disfigurement, which I believe to be the case amongst some of the American Indians.

Then, again, a curious and isolated method of obtaining a light is found amongst the Saribus Dyaks only. (Instrument exhibited.) Here we have a small brass tube lined with lead—no other metal, the natives say, would produce the same result. A small wooden plunger is made to fit the tube, the end of which is hollowed out in the shape of a small cup, in which is placed the tinder (I forget the nature of the tinder, but think it is procured from the inside bark of a tree). The end of the plunger is then slightly inserted in the tube, and by a sharp blow of the hand driven smartly to the bottom of the tube and then quickly extracted, when the tinder is found to be ignited. This we all know is caused by the forcible exhaustion of the air, but how such an idea should have occurred to the savage mind is beyond my comprehension. The natives rarely fail in obtaining a light, and many of them still stick to their tube and tinder in spite of Bryant & May's matches, which are now found all over the country.

Another remarkable specimen from Borneo is the Parang elang (sword) manufactured by the Kyans of the interior.

The blade is concave on one side, and convex on the other, and is manufactured from native iron ore. It is so finely tempered that it will cut through a nail without turning the edge.

The blade is inlaid with brass, the handle being of carved deer horn decorated with human hair. Altogether the weapon is very superior, and is very highly prized by all the tribes in Borneo.

I then alluded to the interesting collection of specimens made by that promising young explorer, Frank Hatton, in North Borneo, the story of whose life is so pathetically told by his father in a book styled "North Borneo," recently published, in which will be found an interesting description of the arms, &c.

In conclusion, I said I believed Borneo offered a richer field than perhaps any other portion of the globe to all those interested in the study of primitive races, peopled as it is by hundreds of tribes showing every graduation of imperfect civilisation, from men living absolutely in a state of nature—who neither cultivate the ground nor live in houses, but who roam the woods in search of plants and fruits, and in quest of game, which they kill with their blowpipes and poisoned arrows—up to the polished Malay gentleman who affects European dress and gives champagne dinner parties to his English friends.

EXHIBITION of PHOTOGRAPHS of NICOBARESE.

By Professor R. MELDOLA, F.C.S.

PROFESSOR MELDOLA remarked that before offering any account of the expedition which led to his visiting the Nicobar Islands in 1875, he should like to call attention to the extreme interest of the fire-producing contrivance from Borneo exhibited by Mr. Crocker. It had long been known that sudden compression of air gave rise to the development of heat, and a common form of lecture illustration was to take a stout glass tube closed at one end and provided with a tightly fitting plunger acting as a syringe. A fragment of tinder or a piece of wool moistened with carbon disulphide is placed at the bottom of the tube and the piston forcibly and suddenly pushed down, when the tinder is ignited or the carbon disulphide vapour caused to flash into combustion. It seemed hardly credible that the apparatus exhibited could have been invented by the Borneans, as the outcome of any elaborate chain of reasoning, and at the same time it was not apparent that any observation of natural phenomena could have originated the contrivance. It therefore appeared to him highly desirable, as an anthropological question of great interest, to endeavour to trace this custom to its origin, and he hoped that those having any opportunities for so doing would not fail to take advantage of them.

With reference to the photographs of Nicobar Islanders, Professor Meldola stated that he brought them in the hope of their being of interest in connection with the paper by Mr. Man announced for that evening, although he was not aware at the time of receiving the notice of the meeting that Mr. Man had himself sent over the fine collection of photographs which they now had the opportunity of inspecting. He did not feel it advisable to make any remarks respecting the anthropology of this interesting people, since his own visit to the islands had been extremely short (only about fourteen days), and he was occupied during most of that time in fitting up and taking down astronomical instruments. He was of opinion that a great deal of bad anthropology had resulted from travellers paying hasty visits to certain places and then writing papers about the natives. It was only observers qualified, like Mr. Man, by actually residing for some time among the people themselves, who were in a position to furnish substantial contributions to anthropological science, and all who had followed this author's previous work on the Andaman Islanders would agree in the opinion that the present subject could not have fallen into more competent hands. The expedition which had led to Professor Meldola's

visiting the Nicobar Islands was equipped by the Royal Society in 1875 for the purpose of observing the total solar eclipse of that year, the station selected having been the Island of Camorta, because this place happened to be near the line of greatest totality, and at the same time the fact of its being a penal settlement enabled the observers to have the benefit of convict labour.

The Director read the following paper:—

A BRIEF ACCOUNT of the NICOBAR ISLANDERS,
with special reference to the Inland Tribe of GREAT NICOBAR.

By E. H. MAN, F.R.G.S., &c.

[WITH PLATES XVII TO XIX.]

THE Nicobar group, situated in the Bay of Bengal, between the 6th and 10th parallels of N. lat., comprises twelve inhabited and a few uninhabited islands and islets whose entire area is estimated to contain about 738 square miles, nearly one-half of which is included in Great Nicobar.¹

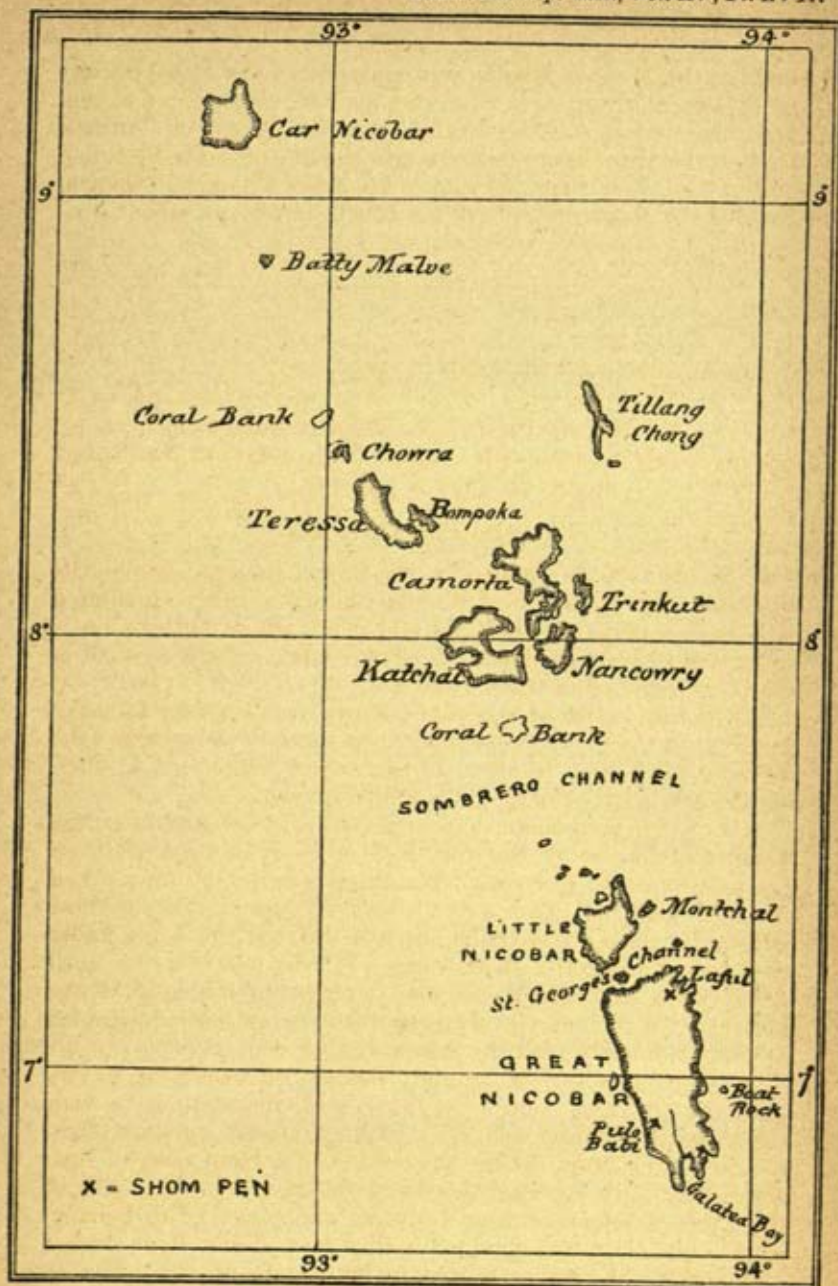
As in the course of this paper it will be necessary to make mention of the government settlement in these islands, a brief account must first be given of the causes which led to their occupation by the British-Indian Government.

It had been long more than suspected that the natives in the vicinity of Nancowry Harbour² had at intervals from 1839 (if not even prior to that date) committed a series of unprovoked murders and outrages on the crews of vessels visiting these islands for purposes of trade, many of their victims being under the protection of the British flag. It was not, however, until 1867, when a flagrant case was brought prominently to the notice of the Straits Government, that the authorities decided to deal summarily with the miscreants.

An expedition was accordingly despatched consisting of two gunboats ("Wasp" and "Satellite") with instructions to visit the suspected villages and, after inquiry into the circumstances, to take fitting steps for the prevention of a recurrence of such atrocities. As a result of the investigation, two or three only of the accused offenders were captured and conveyed to Penang, where conviction was obtained in the case of one alone named "Francis," who was sentenced to imprisonment. In order to

¹ The area of Great Nicobar is 362 square statute miles.

² Situated near the centre of the Nicobar group.



SKETCH MAP OF THE NICOBAR ISLANDS.

afford protection in future to vessels visiting the islands, it was deemed advisable to establish a permanent settlement in a commanding position in Nancowry Harbour, where alone effectual surveillance could be maintained. Having first obtained the sanction of the Danish Government, which till then had been in nominal possession of the islands, the sovereignty of the group was, in April, 1869, transferred to the English Crown by the British-Indian Government, by whom the charge was affiliated to the Chief Commissionership of the Andaman Islands, and it has consequently been from thence that the infant colony¹ has ever since been furnished with its entire staff as well as requirements in respect to materials and stores.

Like the Andaman Archipelago we find the Nicobar Islands peopled by coast and inland tribes, with this difference—that while the inhabitants of the former are negritos of the same and unmixed origin, those of the latter consist of two races, one of which, viz., the natives of the interior, appear as a tribe of pure descent (with certain Mongolian affinities) isolated from a remote period from contact with other people, whereas their fellow-countrymen on the coast exhibit all the characteristics of a mongrel Malay race.

For many years past a belief has been entertained by ethnologists that the inland tribe of the Nicobar Islands (known to the coast people as "*Shom Peñ*")² would be found to supply the seemingly missing and requisite link connecting the negritos of the Andaman Islands with the Semangs of the Malayan Peninsula; but this theory is proved untenable since increased facilities of intercommunication have established the fact that these jungle-dwellers are in no way allied to negritos, being fairer than the Malays and—with one exception,³ so far as our present observations extend—straight-haired. Moreover, the wide and frequently boisterous channel which separates the Andaman and Nicobar groups has effectually prevented intercourse between their respective inhabitants, and sufficiently accounts for the striking dissimilarities which exist, not merely in their physical characteristics and language, but even in their customs and mode of living.

From a rough census taken in 1883-84, it was found that the inhabitants of the Nicobar Islands number about 6,000, upwards

¹ This settlement numbers between 400 and 500 souls, viz.: convicts, 275; Madras sepoys, 50; police, 27; and free residents.

² *Shom* denotes "native," "countryman," "people"; and *Peñ* the particular tribe designated. (This word *Peñ* is pronounced as the French word *pain*.)

³ The only *Shom Peñ* we have yet seen with curly hair is a man named *Ko'ani*, belonging to the *Léfél* community; the coast people, however, assure us that his is by no means an exceptional case, and that other sections of the tribe are known to them possessing the same peculiarity.

of one-half of which are found on Car Nicobar, and 700 on the small island of Chowra; of the *Shom Pen* it is at present impossible to form any estimate, but judging from what we have seen of their few and scattered villages, it seems probable that they do not muster more than a few hundreds, or at the outside from 1,000 to 1,500.

The ratio of population to the area of the various islands may be said to increase from south to north, the chief cause of which may be attributed to the fact that the extent of land naturally adapted for cocoanut cultivation is comparatively limited in the southern islands, which are mountainous and contain for the most part fertile clayey soil covered with dense jungle, while the leading characteristics of the northern islands is low-lying, fertile, calcareous soil, on which alone the cocoanut flourishes most luxuriantly. The extensive plantations of cocoanut trees, especially on Car Nicobar, have attracted a considerable trade, and an average of 45 native vessels, principally from the Straits, Burmah, Ceylon, Coromandel Coast, and Kutch, annually visit these islands for cocoanuts or "kopra," the latter being prepared during the dry months by the traders entirely by means of imported labour, as no inducement could prevail on the Nicobarese to undertake the amount of sustained labour necessary for the purpose.

The coast inhabitants have already been described as of mongrel Malay stock. Traces of an admixture of Burmese and Siamese blood are not unfrequently met with: while annual visits of Burmese trading junks to these islands will account for the former, the latter may find an explanation in a fact which has of late years come under our notice, *i.e.*, that dug-out canoes from the opposite coast of Junkseylon and the adjacent mainland have every dry season been cast ashore at the Nicobars during the prevalence of the strong easterly gales which regularly visit these islands soon after the termination of the south-west monsoon. In two recent instances (December, 1884, and January, 1885) boats of this kind¹ brought parties of four and seven persons respectively, who, in endeavouring to proceed along the coast of their own country, had been carried out to sea by the force of the wind which had overtaken them and, in spite of all their efforts to regain their course, driven them towards the Nicobars; both parties were fortunately provided with sufficient food for the unforeseen adventure, although the same lasted no less than three weeks. The British occupation now enables such castaways to be conveyed back to their own country, whereas in former years necessity rather than choice

¹ Called by the Nicobarese "henfwat."

may have led to their establishing themselves in the land whither Fate had transported them.

Racially, as well as linguistically, the *Peñ* tribe are distinct¹ from their neighbours on the coast, and it is therefore not unreasonable to infer that in this group as elsewhere the aboriginal population have, in the course of centuries, been driven back into the mountain fastnesses by aliens more powerful than themselves, and who, having been brought to their shores by adverse winds or in the ordinary course of navigation, have taken up their abode in the islands and intermingled with such of the people as ventured to remain in their midst.

The above inference is supported by the fact that the inland tribe is confined to the one large island of the group, viz., Great Nicobar, and that most of the other islands, besides being much smaller, contain large tracts of barren grass-land which, though by contrast with the surrounding jungle contribute greatly to enhance the beauty of the country, afford no lasting refuge to those seeking safety from invaders.

We are as yet cognizant of only three *Peñ* communities² in Great Nicobar where alone this tribe, as already mentioned, exists at the present day, viz., one at *Pálo Bábí* on the west coast, another near Galatea Bay on the south, and a third between *Láfúl*³ and Ganges Harbour on the north-east; but there is good reason for supposing that near Boat Rock on the east coast, as well as further inland, other communities of this tribe will hereafter be discovered.

The, to us, best known of the above-named communities is the one near Ganges Harbour which (as will be seen from the accompanying chart) lies to the north-east of Great Nicobar. From the fact of there being two somewhat widely separated approaches to this section of the tribe it was until recently assumed that they were distinct, but it has been ascertained that although, owing to the densely wooded and mountainous character of the country, there is some difficulty of access between the temporary huts near *Láfúl* and those near Ganges

¹ The late Mr. de Rœpstorff more than once recorded his opinion that the *Shom Peñ* are allied to the natives of Chowra island, but I cannot find that he ever attempted to adduce any evidence in support of his views on this subject. While a glance at the accompanying chart will indicate the *prima facie* improbability of such being the case, I, in common with others, have failed not only to discover any special elements of affinity between the widely separated communities in question, but also to distinguish the natives of Chowra from their neighbours in the central group, and at Car Nicobar. These remarks will, I think, be borne out by the comparison of the photographs numbered 4-8, 13, 17, 19, and 20.

² Since the reading of this paper information has been obtained of two more *Shom Peñ* communities (*vide* Supplement).

³ Lit., "East."

Harbour they are connected by jungle paths which are traversed by the *Peñ* people, and thus intercommunication is continuously maintained. Moreover, there is reason to believe that the permanent huts of this section of the tribe—which are further inland—are less widely separated, and that there is, therefore, less difficulty of intercourse between their occupants than would at first sight appear to be the case.

The earliest mention that we find made of the *Shom Peñ*—as they are called by the coast people, or *Shab Daw'a*, as they style themselves—as a separate tribe, is from the pen of the Danish Missionary, Pastor Rosen, who, while resident in the Nicobars between 1831–3 spoke of them from hearsay as in much the same degraded condition as we find them at the present day; he also added that “they wear no clothes, possess no houses, live like animals in the depths of the forests, and shun the sight of men, never leaving their lairs except to search for food, which they sometimes steal from such of the coast huts as are temporarily vacated or occupied only by a few aged or infirm folk whom they are able to surprise and overpower.”

The coast people consider themselves quite distinct from, and very superior to, the *Peñ* tribe, and invariably express surprise and incredulity at the possibility of any doubt or confusion arising on this point. Whenever I have pretended to mistake any of their number for a *Shom Peñ*, the apparent blunder has been either regarded as a good joke or treated derisively.

Until recent years a constant feud has apparently been maintained by the *Peñ* tribe and their neighbours on the coast, chiefly due, it would seem, to the looting propensities of the former when visiting the shore in order to procure certain coveted articles, *e.g.*, beads, cloth, implements, tobacco, &c., not obtainable inland; they also appear to be on the like hostile terms with their fellow-tribesmen living a few miles to the south in the same jungle, for which circumstance, however, no satisfactory explanation can at present be given, although unmistakable proof of the fact was afforded by the extreme terror manifested by a youth of this community when taken up the Galatea River in May, 1884, in the hope that he might prove of service as an interpreter.

The first recorded visit to the *Shom Peñ* was paid by Admiral Steen Bille in 1846; thirty years later Mr. de Rœpstorff,¹ the officer then in charge of the Nicobars, succeeded in penetrating to one of their temporary encampments near the coast; four or five years later he again made two expeditions to the same

¹ For accounts of these trips *vide* As. Soc. Bengal, 1876.

village, in one of which (March, 1881) he accompanied Colonel Cadell, V.C. (Chief Commissioner of the Andamans and Nicobars), on which occasion an accident occurred, Captain Elton, commanding the vessel, being drowned in the surf while attempting to land; this unfortunate incident brought to an abrupt termination a visit which it had been hoped would prove fruitful of good results in the cause of science.

In February, 1884, I first had an opportunity of visiting Great Nicobar and accordingly proceeded to a Bay on the north-east of that island, where there is a coast village known as *Láfúl* (already referred to), the inhabitants of which are nowadays on friendly terms¹ with the nearest community of the *Peñ* tribe. Having explained the object of my visit to the headman, he agreed to go with me on the following morning to the encampment as guide and interpreter. The first half-mile or so of our trip was made in a canoe up a creek, which brought us to a point near the foot of the hill we had to ascend.

After a rough walk of about two hours through light jungle and over the rocky beds of mountain streams, which at that season of the year were nearly dry, we reached the summit, where we came upon a small cleared plateau (1,100 feet above sea level) on which there were two huts, about 8 feet apart, capable of accommodating one or two families (*vide* Plate XIX): one of these seemed to be used principally for cooking purposes, and was connected with the other by a kind of light bridge; the floorings of these dwellings were about 8 or 9 feet above the ground, and access was obtained by means of ladders. A few pandanus and cocoanut trees were growing near the huts, and there were pigs, poultry, and a couple of snarling pariah dogs attached to the establishment.

Nine members of this community were after some delay induced by my guides to adventure out of the surrounding jungle, whither they had retreated on hearing our approach. A few of them appeared to have belonged to the party seen three years before by Colonel Cadell and Mr. de Röepstorff; after distributing food and presents, and finding them reconciled to our presence, I exposed a few dry plates, which unfortunately afterwards proved to have suffered from the climate.²

Confidence in the friendly nature of our expedition being established, I proposed a brief visit to the Government Settle-

¹ The good understanding which has lately been established between these two tribes has resulted in their mutual advantage, and a species of trade may now be described as having sprung up, the *Shom Peñ* receiving beads, cloth, dāhs, tobacco, &c., in exchange for split cane, honey, &c.

² I have lately learnt that the accompanying photo (Plate XVIII), as well as portions of others also taken by me, have been reproduced, without reference to me, in the July number of the "Berlin Zeitschrift."

ment at Nancowry, distant about fifty-five miles, and was agreeably surprised to find that I had prevailed on two youths (brothers) to accompany me, on the understanding that I would bring them back at the end of seven days.

These boys rejoiced in the names of *Atéo* and *Atong*, and were aged about eighteen and fourteen years respectively; their father's name was *Aléo*, and their eldest brother (seen on a subsequent occasion) was called *Ayaw*.

In returning to the coast village with the two lads I could not fail to notice the ease and rapidity with which they picked their way down the rugged and, in many parts, steep hill-side. To keep up with them was a matter of some difficulty, and led to a few unpleasant falls which occasioned no little merriment among the party, who remarked that they were the natural consequence of my being a "*kaling-ta-shapáta*" (i.e., booted foreigner).

The lads I brought away with me were fair specimens of their race: their chests and limbs were well developed, they were timid, but tractable, and submitted with a good grace to ablutions which were found very necessary. The younger of the two (*Atong*) having a severe cut on one of his feet, apparently inflicted a day or two before my visit, it was found necessary to place him under medical treatment, his brother remaining with him for companionship. During the five days of their visit they had, therefore, less opportunity of seeing as much of us, or we of them, as would otherwise have been the case.

Although this is the first¹ recorded instance of *Peñ* natives having ventured from their island home, these lads exhibited the Oriental characteristic absence of surprise at all the novel surroundings and tokens of civilisation which met their unaccustomed gaze in the Government Settlement.

Before parting with the youths their relations carefully noted on a strip of cane or bamboo the number of days that would elapse before their return; this they did by bending back the strip so as to form a corresponding number of cracks on its surface. I was of course, therefore, all the more anxious to fulfil my promise to the letter, and when on the appointed day the steamer arrived with them at the coast village, it was found that their friends were already awaiting them. The lads did not return empty-handed, but were provided with a variety of pre-

¹ The late Mr. de Rœpstorff mentioned having seen at Nancowry in 1873 a youth, said to belong to the *Peñ* tribe, who had visited the central group in company with certain natives of a coast village in Great Nicobar; but as this young man had been adopted or captured in his infancy, and had apparently not since been in communication with his fellow-tribesmen, his visit can scarcely be taken into account in this connection.

sents, such as are most prized by all savage races, viz., beads, cloth, knives, matches, tobacco, &c., and doubtless entertained their friends with many stories of their strange experiences while with us.

The custom above-mentioned of bending cane in this manner, and for similar purposes, is shared by the coast people, from whom indeed it is not improbably borrowed. I further found while preparing a list of *Peñ* words that certain of their numerals differ but slightly from their equivalents in the coast dialects, and though, in their low state of civilisation, it is difficult to imagine any occasion arising which could require the use of high numerals, the *Peñ* tribes are found by no means deficient in this respect.

From the subjoined comparative list of numerals in the dialects of the *Shom Peñ* and the coast people of Great Nicobar, it will be seen that the former, while employing in many instances totally distinct terms have yet adopted the somewhat complicated system of notation current among the latter.¹

Great Nicobar.

	Inland Tribes (<i>Shom Peñ</i>).	Coast Tribes.
1	<i>heng</i>	<i>hē-ang.</i>
2	<i>au</i>	<i>āñ.</i>
3	<i>lūge</i>	<i>lō'e.</i>
4	<i>fūat</i>	<i>fō'an.</i>
5	<i>tain</i>	<i>tanai.</i>
6	<i>lagau</i> (i.e., 3 × 2)	<i>tafū'ah.</i>
7	<i>aiñ</i>	<i>ishāt.</i>
8	<i>lowē</i>	<i>enfō'an</i> i.e., 2 × 4.
9	<i>lung'i</i>	<i>hē-ang-hata.</i>
10	<i>tē'ya</i>	<i>sham.</i>
11	<i>heng-mahau-kod-tē'ya</i>	<i>sham-hē-ang.</i>
12	<i>au-mahau-kod-tē'ya</i>	<i>sham-āñ.</i>
20	<i>heng-inai</i>	<i>hē-ang-inai.</i>
30	{ 20 + 5 × couple. } <i>heng-inai-tain- (ta-au)</i> }	{ 20 + 5 couple. } <i>hē-ang-inai-tanai (tafū'al).</i> }
40	{ 2 + 20. } <i>au-inai</i> }	{ 2 × 20. } <i>āñ-inai.</i> }
100	{ 5 × 20. } <i>tain-inai</i> }	{ 5 × 20. } <i>tanai-inai.</i> }
200	{ 10 × 20. } <i>tē'ya-inai</i> }	{ 10 × 20. } <i>sham-inai.</i> }
300	{ 10 + 5 × 20. } <i>tē'ya-tain-inai</i> }	{ 10 + 5 × 20. } <i>sham-tanai-inai.</i> }
400	<i>heng-tē'o.</i>	<i>hē-ang-mòmchī'ama.</i>

¹ Among the Appendices to my Nicobar Vocabulary (for the publication of which arrangements have already been made) is one which describes this system.

That an elaborate system of numeration should be found among the coast tribes is scarcely surprising, seeing that they have to treat, in their trading operations, with quantities of cocoanuts frequently amounting to hundreds of thousands,¹ but in the primitive condition of the inland tribes no such explanation can be given to account for the fact of a like system obtaining amongst them, for they have no dealings with cocoanuts or similar produce, and their transactions are almost entirely confined to bundles of cane which they bring to the coast people for local purposes, and in exchange for which they receive articles not otherwise procurable by them.

Of words in ordinary use there are very few in the *Shom Peñ* dialect which bear any resemblance to the equivalents in the language of the coast people; where similarity of sound occurs it is found to be in connection with matters of which until recently they were in ignorance, and to express which they have therefore borrowed the terms current among their neighbours; *e.g.*—

English.	Shom Peñ.	Coast Word.
Ship	<i>chó'ag</i>	<i>chóng.</i>
Canoes ²	<i>dō'ai</i>	<i>dō'e.</i>
Cloth	<i>lō'e</i>	<i>lō'e.</i>

With this brief allusion to their dialects I must content myself at this time, and pass on to describe the next visit to the *Peñ* tribe, which I paid in company with Colonel T. Cadell in May, 1884.

We landed at *Láfúl*, and, assisted by our former guides, ascended to the same *Peñ* encampment, where we met fourteen members of the tribe, including *Atéo*, *Atong*, *Ayaw*, and *Ko'ant*, the last named being the individual already alluded to as the only member of this tribe hitherto seen with other than straight hair. Presents and food were distributed, and photographs of the group, as well as of their dwellings, were taken, after which an impromptu entertainment was given for our delectation. A young woman credited with supernatural

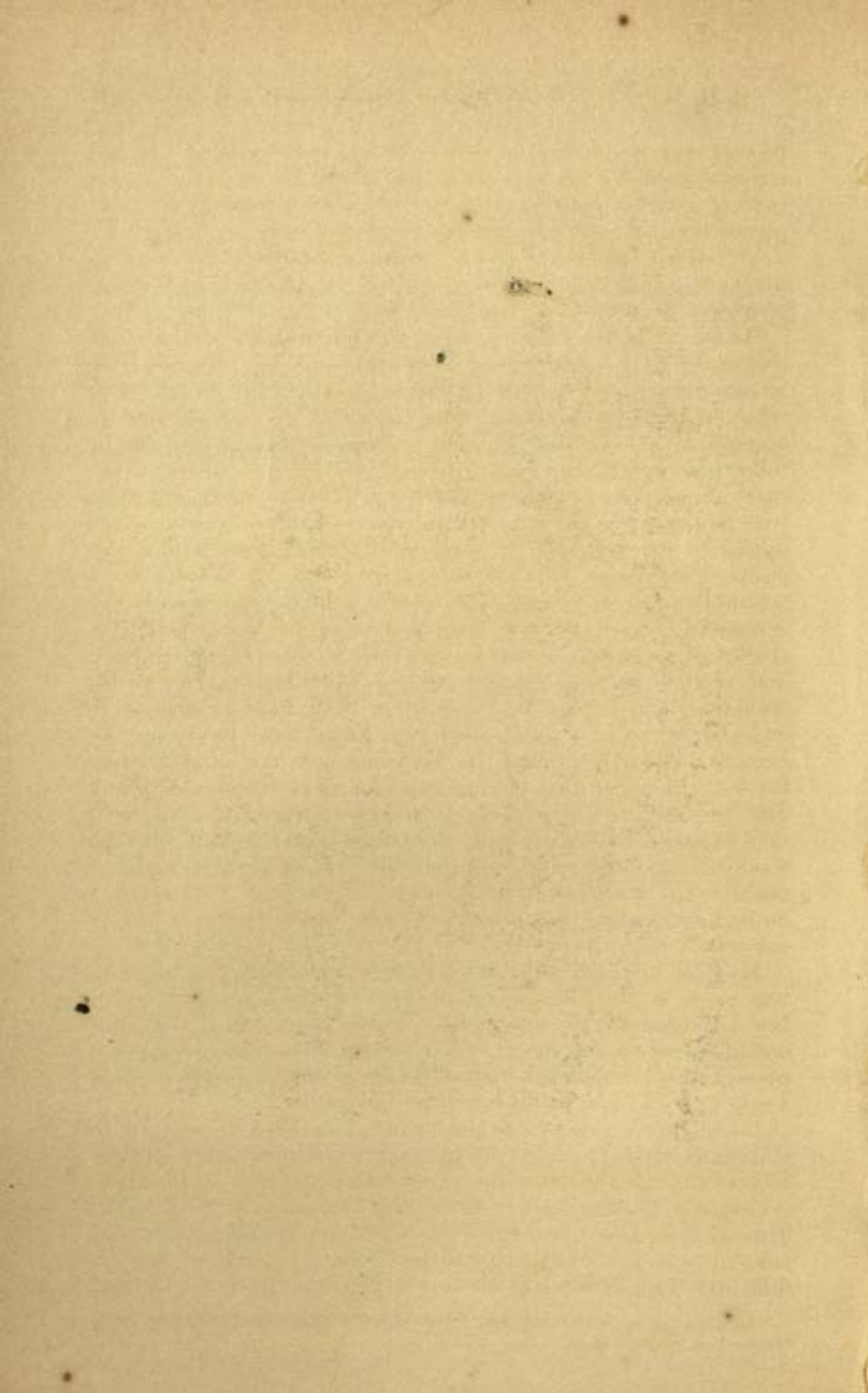
¹ The annual produce is estimated as between 15 and 20 million nuts, of which some 6 millions are exported unhusked, or in the form of "kopra," in exchange for which the Nicobarese accept a variety of articles, principally dāhs, knives, silver, electro ware, &c.; they appear to regard gold as little more valuable than brass.

² As will be seen in the Supplement, it has within the last few months been found that the *Shom* make rafts and canoes, the latter for barter as well for their own use.



EXP-ANOTO. SPRAGUE & CO. LONDON.

GROUP OF SHOM PEN, GANGES HARBOUR.



powers was seated in the centre of the dome-shaped hut, and strips of palm leaves were suspended round her in such a way as to form a sort of curtain; then one of the men, feigning sickness, placed himself at full length on the ground near her, whereupon she proceeded to mumble and press his limbs, and he, acting his part, simulated gradual recovery, on the full attainment of which the performance terminated.

As we wished next to proceed to Galatea Bay at the south end of the island in the hope of meeting some of the same tribe whose presence in the vicinity of the Galatea River had been reported by Admiral Steen Bille in 1846, we induced *Atéo* to accompany the expedition. On arrival at Galatea Bay on the following day I was unfortunately unable to accompany the party on account of an attack of fever. To the surprise of those who took part in the trip up the river *Atéo*, on discovering the apparent object of the expedition, displayed considerable uneasiness, so much so that before he could be prevented he scrambled into the water and swam ashore; his movements, resembling those of a dog, clearly showing his want of skill in the art of natation. After he had been recaptured on the bank and brought back to the boat, it was found necessary to tie his hands and feet together, and even then four persons were engaged in holding him down, so great was the terror he evinced; it was not until the boat retraced its course towards the sea (the expedition having failed in its object of finding any *Peñ* encampments¹) that the poor fellow recovered from his fright and regained confidence and composure. On his return to the steamer he pointed with a smile to the cuts on his arms and legs made by the rope during his struggles in the boat. There being no further need of *Atéo's* services (!) he was landed at *Láfúl* on our way back to Nancowry.

My next trip to Great Nicobar and the *Shom Peñ* territory was made in the following September, when I again ascended the hill near *Láfúl* and found everything in much the same condition as on my former visits. After distributing food and presents I took some photographs and returned to *Láfúl* where I saw *Atéo*, *Kóánl*, and three other *Shom Peñ*.

I took their photos and persuaded *Atéo* to accompany me to Ganges Harbour, to assist me in making the acquaintance of his fellow-tribesmen residing there, and to endeavour to induce them to come with him on a visit to the Government Settlement. This he agreed to do provided certain of his coast friends would consent to escort him there and back; on this point we had no difficulty, and as soon as matters were arranged to our mutual

¹ In consequence of the community having removed to the jungle bordering the western shore of Galatea Bay.

satisfaction we weighed anchor and steamed round the north-east point of Great Nicobar, and anchored in Ganges Harbour. On landing in one of the small shallow bays on the east side of the harbour I sent *Atéo* and his coast friends in advance to prepare any members of the *Peñ* community they might meet for my intended visit. I followed a few hours later, and found that the *Shom Peñ* in this part possessed some small scattered clearings sufficient for the erection of a few temporary huts which they occupy from time to time on their visits to the shore, where, or in the vicinity of which, they collect such jungle products and obtain certain requirements of their daily life as are not procurable in the interior. Only a few members of the community put in an appearance, but these we convinced of our friendly intentions by giving them a quantity of food and sundry presents; I then obtained, with the assistance of our mutual friends (the coast people), a long list of *Shom Peñ* words in common use, including their numerals. Six of the party were then photographed, and two of their number¹ were persuaded to accompany *Atéo* in a trip to Nancowry. Promising to return with them in six days we started on our homeward journey, which proved very rough and stormy; in spite of the discomfort they had to endure on the open deck the lads behaved well, uttering no complaints.

After spending a few hours at my house they were invited by the headman of a neighbouring village, named Johnson—who, having accompanied us on our recent voyage, was no stranger to them—to pass a few days with him; the lads were willing to go, and I saw no reason to prevent their doing so, as they were to be accompanied by their *Láfúl* friends. On the second morning of their absence I received the startling news of their sudden disappearance during the previous night; as nothing had occurred during the thirty-six hours of their stay in the village which could have excited any apprehensions in their minds, considerable surprise and uneasiness was caused by their conduct. Every effort was at once made to discover their hiding place, but the fugitives had taken the precaution of treading on stones, logs, and spreading roots of trees, &c., so that only a few footprints were visible leading into the jungle where all further trace of them was lost.

As they had not yet made their reappearance up to the day of my promised return, I was obliged to start without them, but in order to let them know that I was doing so (it having been ascertained that they were still in the neighbourhood, fruit and other food having been missed) I tried to warn them of my

¹ The names of these two lads were *Panoñ* and *Dedoñka*.

movements by using the steam-whistle, with the sound of which they were by this time familiar, but all in vain. On arrival at *Láfúl*, the position of affairs was explained to *Aléo* and *Ayaw*, father and brother of *Atéo*, who consented to visit Nancowry and assist us in searching for the missing trio. On our return we were greeted with the news that on the very night of our departure, a small canoe and three paddles had been surreptitiously removed from a village near Johnson's, from which circumstance, as well as from certain footprints on the sand, the natives concluded that the runaways, taking notice of the departure of the steamer, and regarding the chances of a return to their homes as lost, had made a foolhardy attempt to reach Great Nicobar in a canoe. Although the weather was fine, their ignorance in handling a canoe would have precluded the possibility of their reaching in safety any of the southern group of islands.

Notwithstanding that two or three trips were made by the steamer to leeward of the course probably taken by the boat, and in spite of inquiries made at the various islands between Nancowry Harbour and Great Nicobar, nothing was ever again heard of the unfortunate lads.

Aléo and *Ayaw*, after a brief stay at Nancowry, during which they were photographed, were conveyed back to their homes, where it is hoped they informed their friends that the disappearance of the trio was due to no fault or foul play on our part. Nevertheless, the relations between the coast-people and the inland tribes near Ganges Harbour were for several weeks not a little strained; but I was assured during my last visit to the island (April, 1885) that intercommunication had been re-established on the former footing. I had, however, no opportunity of confirming the truth of this statement from personal observation, as my only subsequent trip to Great Nicobar, with the object of communicating with the *Shom Peñ*, was made in the above-mentioned month in company with Colonel Cadell, when we visited other encampments near Galatea Bay and *Pálo Bábí*. At the former place we had ascended eleven or twelve miles up the river when our progress was arrested by a large fallen tree across the stream. As we had been previously assured by the coast natives that the *Shom Peñ* community in these parts had some time since removed from the banks of the river to the jungle eastward of Galatea Bay, we were prepared for the absence of all traces of the encampment seen by Admiral Steen Bille thirty-nine years before. During this visit we were told by the villagers on the east shore of the Bay that the *Shom Peñ* had, a few days previously, made a raid on one of their isolated huts, which they had robbed and burned; owing to the briefness of our visit, we were unable to ascertain for our selves the truth of the accusation.

At *Pálo Bábí* we were more fortunate, and under the guidance of the coast people there were led about two miles inland to a secluded spot near the creek. One or two of our guides went on in advance to warn the *Shom Peñ* of our approach; we therefore found them prepared to receive us, and as composed as if such an event as a visit from Europeans was a matter of every-day occurrence, whereas there is every reason to believe that none of the party had ever before seen a white face. From their demeanour, and the silence they maintained during the half-hour we spent in their company, it was evident that they were somewhat apprehensive of our intentions and awed by our strange appearance. The clearing that they occupied was only about 30 yards square, but the litter from split cane and secondary growth left little space for locomotion.

I exposed two or three dry plates, but owing to the dense overhanging foliage, and the difficulty of making the *Shom Peñ* understand the necessity of all keeping still together for two or three seconds consecutively, the exposure proved insufficient. We found the people of this community were evidently of the same race as those between Ganges Harbour and *Láfúl*; nothing, in fact, could we discover about them or their surroundings which could distinguish them from the latter: they wore the same scanty attire, and similar bead necklaces, ear-sticks, and headbands, mention of which will shortly be made. Their huts were of the light frail description denoting occasional occupation.

Judging from the small parties of the inland tribe which we have hitherto seen, these savages may be described as very fairly developed, well-nourished, and while young favoured with pleasant features. Their skin is fairer than the generality of the coast men, who again are usually less dark than the Malays. At this early stage of our intercourse it is hardly necessary to say that it has been impossible to subject a sufficient number to careful and systematic measurements, but from such rough calculations as have been made the average height of the *Peñ* male adults appears to range between 5 feet 2 inches and 5 feet 8 inches, which is about 2 to 3 inches less than the ordinary stature of the coast tribes. Their eyes conform to the Mongolian type, and the ears, like those of the coast people, are pierced for the insertion of a wooden or bamboo ornament; one woman I found wearing a disc measuring 5 inches in circumference.¹ As mentioned in my monograph, "On the Aboriginal Inhabitants of the Andaman Islands" (*q.v.* p. 115), the coast villagers in the Nicobars are in the habit of flattening the occiputs of their infants. As the *Shom Peñ* have not adopted this practice it is to be

¹ This object I have lately forwarded to Professor Giglioli, Florence.

supposed that they fail in considering it an improvement upon nature. The feet and hands of the *Shom Peñ* are large and coarse, and testify to the rough work on which they are habitually engaged.

Unlike the coast people, among whom it is the practice for the women to keep their hair closely clipped,¹ and for the men—at least on many of the islands—to cut theirs also when mourning, the *Shom Peñ* of both sexes have been remarked as wearing their hair uncut and unkempt, and as habits of cleanliness are foreign to their nature its condition can better be imagined than described; it is straight and lank, and rarely reaches below the shoulders; the colour is black or dark-brown. It is asserted, with how much truth I am not yet in a position to state positively, that when engaged in hostilities the men are in the habit of cutting off their hair in order that it may not prove an inconvenient assistance to the enemy at close quarters. Little or no hair is seen on the face although neither shaving nor depilation are practised.

As a result of their friendly intercourse in recent years with the coast people, the inland tribe are gradually acquiring the habit, so generally practised among the latter, of chewing the betel-nut, *Chavica betle* (*pán* leaves), with or without quicklime, and are consequently beginning to be similarly disfigured with black teeth. Happily for their personal appearance they have not yet adopted the custom to such an extent as to render the teeth hideous and unrecognisable from being coated with a thick hard mass protruding from the gums so as to make it in many cases an impossibility for the lips to meet. This remarkable disfigurement, which is more or less commonly seen among most of the inhabitants of this group, is said to be favourably regarded by the fair sex, who, indulging as they do, though in a less degree, in the same habit, would scorn to accept the addresses of one possessing white teeth, "like a dog or pig"! The only plea to be urged in favour of the revolting practice is that it seems to procure immunity from toothache, a malady almost unknown among the Nicobarese, who also attribute their exemption therefrom to this cause. It is a strange fact that their sense of taste appears in no way affected, and that their powers of mastication are likewise unimpaired.

In the matter of attire the *Peñ* males affect the peculiar loin cloth which among the Nicobarese—as formerly among certain other tribes in the Malayan Archipelago²—satisfies the require-

¹ This is said to be due to their being so generally employed in cooking and preparing food.

² "The original dress of the males, to which a few individuals whom I met are still restricted, is the *cháwát*—a narrow strip of cloth passing between the legs

ments of decency. It usually consists of a strip of Turkey red cloth, about 6 feet long and 3 or 4 inches wide, which is so adjusted between the thighs and round the hips as to allow of some 12 or 15 inches hanging down behind giving the appearance of a tail. From the clumsy mode in which this garment is worn by the *Shom Peñ*—necessitating frequent readjustment of the folds—one is led to infer that its use is not *de rigueur*, but reserved for special occasions, as when receiving or visiting strangers. The women are content with a short skirt of blue cloth when obtainable, or they provide themselves with a similar garment made of the bark of the *Celtis vestimentaria*.¹ In addition to the ear ornaments already mentioned, both sexes affect small bead necklaces, and they further usually bind a spathe band or a piece of cloth round the head.

Regarding the moral and psychical characteristics of the *Shom Peñ*, we are not yet in a position to speak with any certainty; the scanty information we have as yet obtained having been gathered from the coast people cannot be altogether relied upon for accuracy; on these, therefore, as well as upon other points of ethnological interest, I am unable to enlarge in the present paper. It should also be borne in mind that the task of obtaining information regarding the habits, customs, &c., of the *Shom Peñ* is not easy of accomplishment, for apart from hindrances due to want of knowledge of their language, distance from Nancowry, and consequent inability to make many or lengthy visits, their natural fear of Europeans (and indeed of all strangers), as well as their constant feuds with the coast inhabitants, and seemingly even with other sections of their own tribe, combined with their frequent absences on hunting or predatory expeditions, present serious obstacles to careful and systematic observations.

I may casually mention that the sole weapon used by the *Shom Peñ* is a wooden pointed spear (called "*hin-guan*"), which is regularly notched near the upper part in order to serve the purpose of barbs.² The huts of the *Shom Peñ* are much smaller and ruder in construction than those found in the Nicobarese

and fastened round the waist." (*Vide* "The Binuas of Johore," "Journ. Indian Archipelago," 1847, p. 252.)

¹ "Many of the Mintirá around Gunong Bermun still wear the bark of the tiráp, the men using the cháwát, and the women a piece of rude cloth, formed by simply beating the bark, which they wrap round their persons, and which, like the sarong of the Johore females, reaches only from the waist to the knees. The Udái females wear the cháwát like the males." (*Vide* "Journ. Indian Archipelago," 1847, p. 253.)

² *Vide* Plate XXVI, fig. 5, of vol. xi, "Journ. Anthropol. Inst.," 1881. In the same plate, and in Plate XV of vol. vii (1878) of the same Journal, will be found illustrations of the various spears, as well as sundry other objects made and used by the coast inhabitants of these islands.

villages along the coast or in the other islands of the group; but those that are of a permanent character sometimes partake of the same beehive form which commonly mark the dwellings of the coast people, being in like manner raised on posts 6 or 8 feet above the ground, entrance is effected by means of a primitive ladder formed of rough pieces of wood, bamboo or rattan, lashed together with strips of cane. The space beneath the hut is sometimes fenced in, or the posts on which it is raised are ranged so closely side by side as to form a species of den or cage wherein they confine and fatten any pigs they succeed in capturing alive. A separate hut of low construction is occasionally seen in these encampments which has been specially erected as a pigsty.

The roofing of these huts is ingeniously contrived, and consists of large sheets of a description of bark resembling somewhat the spathe of the *Areca augusta*. I have not yet obtained information as to the method of its preparation, and can therefore only here note that if not entirely waterproof it affords very fair protection even in the heavy showers so common in these latitudes.

A further difference is also observable in the huts of the *Shom Pen* which are found within easy distance of the shore and those a few miles inland. The former are smaller and more frail, while the latter, as being intended for permanent occupation, bear evidence of some care in construction, and are usually erected on small clearings, preferably on the summits of one or other of the numerous hills which afford suitable sites for the purpose; where this is not practicable a spot is selected in some remote situation, or which commands a view of its approaches: this fact is of course easily explained by the constant feuds which have so long been maintained between themselves and their coast neighbours, and, judging from the incident already related, other *Pen* communities.

In the roughly cleared spaces near their huts the *Shom Pen* are found to be in the habit of planting yams and other edible roots, as well as fruit trees, such as cocoanuts, pandanus, &c., which, being indigenous to the soil, require little care in cultivation. In their ignorance of agriculture they are, however, compelled after a few years to abandon land which has become impoverished, and accordingly betake themselves to new sites. It has been observed that these plantations are sometimes enclosed by a rude fencing, presumably to protect them from the depredations of wild pigs; the fallen trunks of trees in these clearings are not burnt or cut up, but are turned to some account by being used as footpaths through the surrounding undergrowth.

Probably the most striking peculiarity in their domestic arrangements is the sack-like cooking vessel, which is made of a stout bark substance similar to that already referred to as

being used for the roofing of their huts.¹ A large sheet of this bark is folded and secured by means of posts stuck into the ground in such a way as to present much the appearance of an open sack; the depth varies from 1 to 3 feet, but depends to some extent on the size of the piece of bark available; the bottom of this utensil is generally about a foot above the ground so as to allow sufficient space for a fire underneath.



SHOM PEN COOKING VESSEL.

The accompanying sketch will perhaps make my meaning a little more clear. I should add that these unique cooking vessels,² which appear to be used for boiling meat, pandanus, yams, &c., are declared to be commonly found throughout all the scattered encampments of this inland tribe. It is said, however, that the communities living on the west coast (near *Pálo Báblí*) appreciate the superiority of earthen pots over their own bark sacks for cooking purposes, and are glad to procure through the coast people specimens manufactured by the inhabitants of Chowra.³

Repeated efforts have been made to colonise the Nicobars, but they have all hitherto resulted in failure owing to the deadly malarial fever which prevails more or less at all seasons of the year throughout the group, and which has proved especially trying and fatal to Europeans and other foreigners who have attempted to settle, or who have even merely visited the islands in the last and present centuries. Instances indeed are recorded of persons who have succumbed after spending a few hours only in some more than usually malarious spot.

The comparatively low death-rate of the new British Settlement at Nancowry Harbour, which has always been distinguished as one of the most unhealthy localities, is of course in

¹ For their cooking vessels they employ the bark of three varieties of trees known to them as *hon god'ng*, *takó*, and *minfó'a* (this last has been identified by Dr. King as *Calophylleene* sp.); whereas for their huts they use one or both of the trees not yet identified, but called by them *ók-fúk* and *dai-ók-shúkk*.

² A specimen, forwarded by Colonel Cadell to Edinburgh, may be seen in the Museum in that city.

³ These treasures are seldom obtainable, however, as the coast people rarely procure sufficient quantities for their own requirements.

great measure due to the sanitary precautions which have been adopted during the past sixteen years, as well as to the facility with which sufferers who fail to recover can be removed to one or other of the various healthy stations in Port Blair Harbour (Andaman Islands), distant about 240 miles. It is, however, a melancholy fact that, in spite of apparent recovery and ability to resume work, many have suffered serious, if not permanent, injury from the effects of this fever; even the aborigines themselves do not enjoy immunity from its ravages, but are frequently prostrated by it, and many of the deaths which occur among them are distinctly traceable thereto. Among the other ills to which the Nicobarese are subject is elephantiasis, the causes of which may probably be found in the damp nature of the climate, the insanitary conditions of their village sites and surroundings, and the foul water, although of this they partake but sparingly, being much addicted to the use of *dábs* (water of the young cocoanuts) and palm wine (*tari*).

An attempt is now being made to colonise these islands with Chinese, and there can be but little doubt that if sufficient inducements are offered to lead them to establish themselves in large numbers on any of the thinly inhabited and fertile islands a marked improvement will soon be visible in the sanitary condition of the particular locality selected, as clearances of jungle, reclamation of swamp land and its cultivation, are essentials which would at once occupy the attention of these excellent colonists, leading inevitably to the same happy results which have been experienced in the now flourishing and healthy colonies of Penang and Province Wellesley, formerly so notoriously insalubrious.

Before concluding this paper it may not be uninteresting to note briefly the various attempts made in modern times by missionaries and foreign Governments to convert the Nicobarese and to colonise their islands. Omitting Kœping, who, in 1647, merely made a flying visit and brought away a fanciful story of men with tails, since explained by the mode of attire affected by these islanders, and to which allusion has already been made, we come to the mission, extending over two years (1711–13), conducted by two Jesuit priests who are said to have met with a violent death at Nancowry. The next settlers were Danes who, in 1754–6, established themselves at Great Nicobar, but within a year moved to Nancowry, where they remained for some time on the spot now occupied by our colony. Twelve years subsequently (*viz.*, in 1768) some Moravian missionaries from Tranquebar settled on the opposite side of the same harbour, where they and their successors, numbering twenty-five in all, laboured for nineteen years without being gladdened by the

conversion of a single native, while they each in turn, either there or soon after their removal to Tranquebar, fell victims to the fever, one alone of their party escaping with his life, who, writing many years after his return to Europe, mentioned that he was still subject to constant returns of the same malady. On the abandonment of the mission, and in order to assert their claim to the islands, the Danes maintained a petty establishment in Nancowry Harbour during the next twenty years, at the expiration of which (viz., 1807) they were ousted by the British, with whom their country was then at war; seven years later, however, the islands were restored to Denmark, and were nominally occupied till 1837. During the last six years of this period a second attempt to Christianise the islanders was made by a mission under Pastor Rosen, but owing to sickness, and the continued apathy of the natives, the result was again ill-success and abandonment.

A final attempt to form a Danish Settlement was made on the occasion of the expedition of the R.D. corvette "*Galathea*" in 1846, when a careful survey of the islands was undertaken, but two years later this experiment was relinquished, and the Danes finally quitted the island. It was not, however, until 1869 that their connection with the Nicobars was completely severed, and the group annexed by the British under the circumstances already narrated.

It remains to be stated that while the present colony has completely attained its original object of suppressing the piratical acts of which the natives, especially of the central islands, had been guilty during a long series of years, it has also been the means of attracting a regular and growing trade with neighbouring countries, and at the same time raising the natives from the condition of ignorance in which they had previously existed regarding the benefits and resources of civilisation.

SUPPLEMENT.

[Added after the paper had been read.]

Early in the current year Colonel T. Cadell, accompanied by Mr. E. H. Man, paid another and more interesting visit to the *Shom Pen* encampments of Great Nicobar, the results of which are embodied by Mr. Man in the following notes.

Leaving Nancowry on the 7th January we spent six days in the southern islands of the group, and were enabled, through the assistance of our coast friends, to visit some of the encampments already described, and also another on the west coast of Great Nicobar, whither no European before had trespassed.

We now are aware of five sections¹ of the inland tribes which are more or less well known to the coast people, having each huts and gardens within a mile or two of the shore. It is further positively asserted that there are other communities of the same tribe living in the depths of the jungle who, like the *ērem-tā-ga*- of the Andaman forests, rarely if ever venture to come down to the sea. We are not yet able to ascertain the exact position of these villages, or their probable strength, inasmuch as the coast people have only on one or two occasions penetrated so far inland.

The encampment now visited for the first time is situated on the bank of a river² hitherto unknown to us, but which proves to be as fine as the Galatea.

We had paddled up the stream for about an hour when we came upon a hut, which, from the neatness of its construction, might have been readily mistaken for one erected by the coast people; the chief differences to be noted were, first, that the posts were not so firmly planted, and secondly, that the floor was raised 10 feet above the ground in lieu of 6 or 7 feet, as is usual in the coast villages. On entering the hut we found two men and two women, seated tailor fashion, cross-legged on the floor, *i.e.*—

1. *Gai*, a man probably about thirty years of age, and husband to the two women.
2. *Dau*, a youth of about eighteen, and unmarried.
3. *Kīnai* } Half-sisters and wives to No. 1.³
4. *Kōap* }

These four persons had hair reaching below their shoulders, unkempt and uncut; in their ears were large wooden ear-sticks; their skin was of the same colour as that of the coast people to whom also they bore more resemblance, both in feature and general appearance, than has been noticeable among the *Shom Peñ* of other communities.

Both men had on loose Chinese drawers, and also the ill-adjusted loin-cloth, which they evidently wear in imitation of the *neng* of the coast men.⁴

¹ These encampments are found at the following points:—

1. Near Lāfūl and Ganges Harbour. (Reckoned as one owing to constant intercommunication.)
2. At Galatea Bay.
3. Near Pulo Babi, on the west coast. (Visited last year for the first time; it is called by the natives "*dāk-ta-yat*.")
4. Near Kashindōn on the west coast. (Called "*dakan-kat*.")
5. Between Kashindōn and Pulo Pet. (This encampment is known as Pulo Kungi, and has yet to be visited.)

² The native name of the river is "*dāk-a-naing*."

³ I took special pains to have this point so confirmed as to leave little room for doubt as to its accuracy.

⁴ The *Shom Peñ* declare that the adoption of this garment is of recent date,

Gai (No. 1) had two necklaces of string, one of which was black from long use, but the other was newly and neatly made of a whitish fibre twisted evenly round a narrow strip of some red cotton fabric:¹ with this he was willing to part, receiving in exchange a bead necklace I had brought with me.

Dau (No. 2) had no necklace.

Both women had small coloured bead necklaces similar to the one I had just bestowed upon *Gai*; they wore the usual short cotton shirt, and had a piece of the same material wound round the upper part of their persons; they had also bands of fibre round their heads, apparently to keep the hair from falling over the face when cooking or stooping, &c.

Kō'ap (No. 4) is the first *Shom Peñ* I have seen with the disfigurement so common among the coast people, i.e., with the front teeth of the upper jaw encrusted together so as to protrude and prevent the lips from closing; it would be a matter of difficulty, if not an impossibility, for one tooth to be extracted without the others.

At the further end of the hut, opposite the entrance, as is also the custom of the coast people, was a sanded hearth,² on which were standing three of the sack-like cooking vessels peculiar to the *Shom Peñ* (called *tē-ag*); they were of different sizes, and I observed that the sides were kept apart by means of sticks placed across inside.

The impression we produced upon our new acquaintances was apparently favourable, for they intimated through our guides that if we returned in a few weeks' time they would be willing to accompany us on the return journey.

On our way back to the coast we sighted a small canoe containing a young couple (called *Patōi* and *Tain*), belonging to the community we had just been visiting, who had, it seems, been absent on some fishing expedition; immediately on perceiving us they turned and paddled away rapidly until assured by the shouts of our coast companions that they had no cause for fear, when they allowed us to come up with them and showed no further signs of alarm, but willingly walked with us and accepted presents of beads, tobacco, biscuits, &c.

In noting down the words for common objects as spoken by these (*dakan-kat*) people I found that in most instances they differed from the equivalent used by the *Shom Peñ* of Lāfūl and Ganges Harbour. Each community of the tribe appears to

"within the memory of living men"; this probably indicates the period during which less hostile relations have existed between the coast and inland tribes.

¹ This necklace measures 10 feet 9 inches in length, and the red cotton foundation is $\frac{1}{4}$ inch in width.

² When fire is not otherwise obtainable, the *Shom Peñ* produce a flame by means of the ordinary fire sticks.

possess a dialect more or less distinct, but this is what might reasonably be expected when we consider the isolation of the several encampments, and the difficulties of intercommunication, apart even from the hostile relations in which they stand towards one another.

The surprising discovery was made on this trip that the *Shom Peñ*, or at any rate certain sections (viz., those at Láfúl and Ganges Harbour and on the west coast), are in the habit of constructing rafts and boats, the latter not only for their own use, but also for purposes of sale, or more properly speaking, of barter, with the coast tribes. We saw both rafts and canoes; the former are made of bamboos neatly tied together, and the latter are not distinguishable from those seen at the coast villages, except perhaps from the fact that they are not quite so carefully finished. The size of the canoes made for their own use varies from 6 to 10 feet, but we are informed that much larger ones measuring sometimes as much as 20 to 24 feet are made for the coast tribes to whom it seems that the finishing of these crafts is invariably left.

The *Shom Peñ* do not venture out to sea in their skiffs, but use them merely for crossing the rivers or creeks near which their encampments are situated, or for skirting along the coast where they plant fishing stakes which are similar in every respect to those seen in Malay villages.

After leaving *dakan-kat* and the west coast we went to the Ganges Harbour community, which had not been visited since the unfortunate disappearance of one of its members and two other youths in September, 1884 (*vide ante* p. 438). We took the precaution of sending our guides in advance to reconnoitre, and were informed on their return that only two men were within hail as far as they could ascertain, but that these were unwilling to accept their assurance that *friends* were about to pay them a visit. Nevertheless we proceeded on our way, taking presents and my camera. I found that one of the men was *Poko*, father to *Dehoñha*, one of the missing lads; nothing worthy of note transpired during the visit, but I succeeded in taking a photograph of the clearing, with the three tiny huts and their occupants.

We noticed that the trunks of the cocoanut trees were encircled with pieces of the stems of the thorny calamus, evidently with a view of warning strangers that the fruit was not to be touched. Among the coast tribes a similar practice obtains, but they deem it sufficient to tie a leaf round the trunk, and the vast majority accept the token as a warrant of ownership.

It is said that the *Shom Peñ* bury their dead, but do not

afterwards disinter the remains, as is done by the coast people throughout the group. The limbs of the deceased are tied together, and the corpse is placed in a sitting posture in a grave which has been prepared in the jungle surrounding the encampment. The huts are then deserted, and the locality only visited for the purpose of gathering the ripening fruit in the plantation which generally is found in every *Shom Peñ* village. As permanent abandonment of an encampment on account of a death would lead to great inconvenience, I am prepared hereafter to learn that, as among the Andamanese, there is a limit placed on the *tabu* in such cases.

Explanation of Plates XVII to XIX.

Plate XVII.—Sketch map of the Nicobar Islands, showing the position of the *Shom Peñ* tribe.

Plate XVIII.—Group of *Shom Peñ*, from Ganges Harbour, Great Nicobar. Enlarged from a photograph by Mr. Man.

Plate XIX.—*Shom Peñ* hut, near *Láfúl* village, north-east of Great Nicobar. From a photograph by Mr. Man.

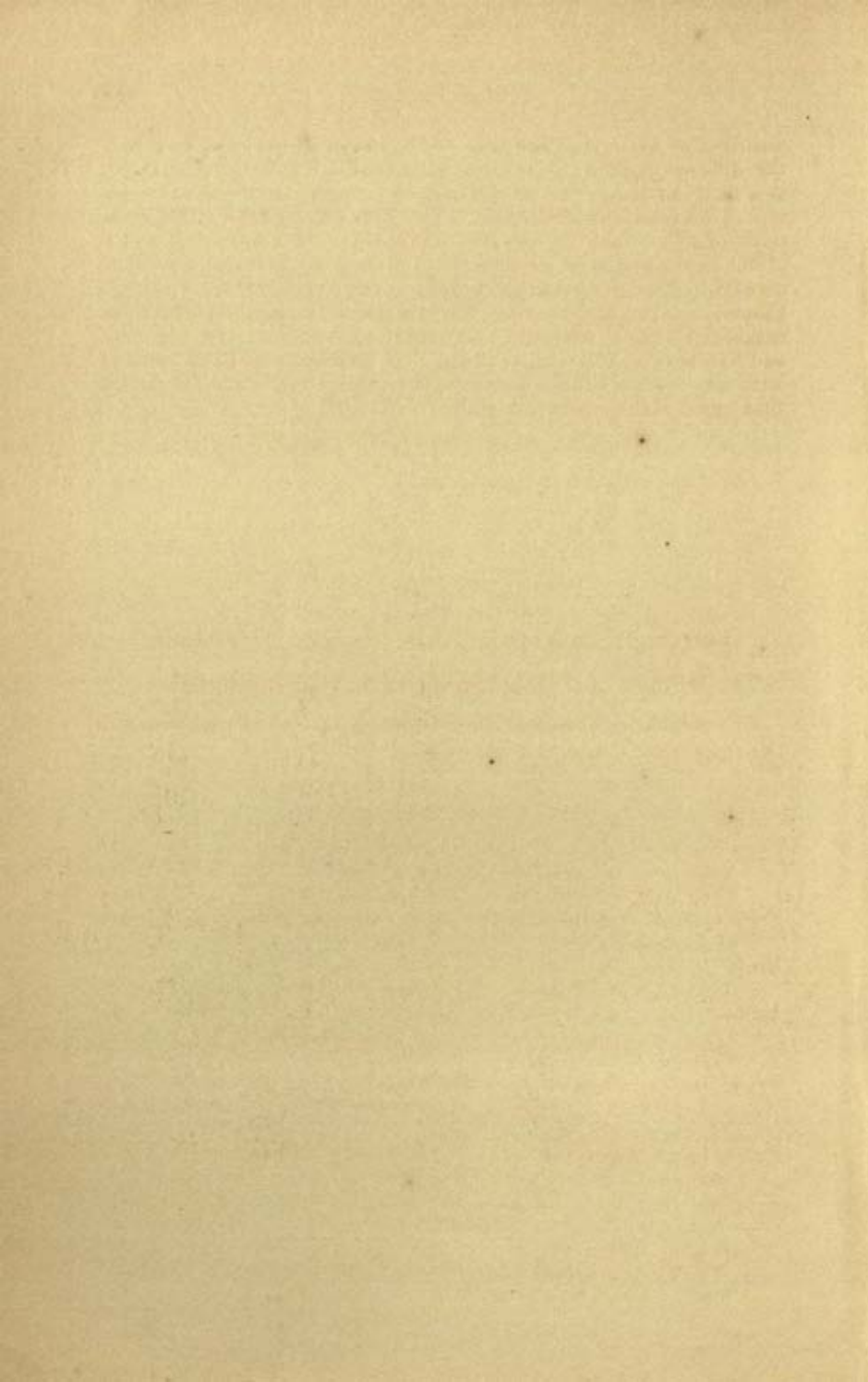
DISCUSSION.

Dr. MOUAT said, in response to the call of the President, that he was afraid he could throw no light upon the matter regarding the Nicobarese contained in the excellent paper of Mr. Man. He had not landed on any of the islands, and had no personal knowledge of their inhabitants. The little information he previously possessed was derived from a well-considered monograph written by an old friend and schoolfellow of his, the late Captain Harold Lewis, who had accompanied Commander Stein Bille in the visit to the Nicobars mentioned by Mr. Man, which led to the cession of the islands to the British Government. Captain Lewis's monograph recorded many interesting facts regarding the islanders as they then were, but Dr. Mouat had unfortunately mislaid the brochure, and could not venture to state from memory, unaided, how far the people were then as they are now. He regretted this, as the history of the fast disappearing aboriginal races of the Tropics was of considerable scientific interest. As respects the kindly mention made of his own work in the Andamans, Dr. Mouat was well aware of the liability to error of all observations made in difficult circumstances, but in the expedition under his charge every care had been taken by himself and his colleagues, the late Dr. George Playfair and Captain Heathcote, of the Indian Navy, to verify the accuracy of all the statements embodied in his official report. The work was divided between them, and at the end of each day was reduced to writing, carefully discussed, and the results finally



SHOM PEÑ HUT, LÁFUL.

166-PHOTO. SPRADUE & CO. LONDON.



recorded by himself at the time. The object of the expedition was the difficult task of selecting a suitable locality for the formation of a final settlement for the Sepoy Mutineers, and to this all else was of necessity subordinated. The difficulty of making observations of any kind was greatly injured by the constant hostility of the brave and bold savages who opposed them on every possible occasion. On completing the urgent work entrusted to the Andaman Committee, Dr. Mouat urged the late Lord Canning to permit the expedition to go back and thoroughly explore both the Andaman and Nicobars, but the exigencies of that time prevented a compliance with his request, the scientific interest and importance of which that great viceroy fully recognised.

JANUARY 12TH, 1886.

FRANCIS GALTON, Esq., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From SIR JOHN LUBBOCK, Bart.—Ymer Tidskrift utgifven af Svenska Sällskapet för Antropologi och Geografi. 1881. 1a-4e Häft.; 1882. 1, 2, 6, 7, 8e Häft.; 1883. 1a Häftet.
- From C. H. E. CAEMICHAEL, Esq., M.A.—Report of the Royal Society of Literature, 1885.
- From Messrs. TRÜBNER & Co.—A Compendium of the Castes and Tribes found in India. By Eustace J. Kitts, B.S.C., M.R.A.S.
- From ALEXANDER AGASSIZ, Esq.—Twenty-fifth Annual Report of the Curator of the Museum of Comparative Zoology at Harvard College, for 1884-5.
- From Dr. J. KOPERNICKI.—Charakterystyka Fizyczna Ludności Galicyjskiej. Seryja II. Opracowana przez Drów J. Majeria i I. Kopernickiego.
- From the DIRECTOR OF THE UNITED STATES GEOLOGICAL SURVEY.—Fourth Annual Report, 1882-3.
- From the AUTHOR.—The Periodic Law. By John A. R. Newlands.
- Notes on the For Tribe of Central Africa. By Robert W. Felkin, M.D.
- The Prytaneum, the Temple of Vesta, the Vestals, Perpetual Fires. By J. G. Frazer, M.A.

- From the AUTHOR.—Notes on the Geological Position of the Human Skeleton lately found at the Tilbury Docks, Essex. By T. V. Holmes, F.G.S.
- Gli Antichi Oggetti Messicani incrostati di Mosaico esistenti nel Museo Preistorico ed Etnografico di Roma. Memoria del Socio Corr. Luigi Pigorini.
- Dalsze Poszukiwania Archeologiczne w Horodnicy nad Dniestrem. Opisał Dr. L. Kopernicki.
- From the ACADEMY.—Actas de la Academia Nacional de Ciencias en Córdoba. Tom. V, Ent. 2.
- Antiquarisk Tidskrift för Sverige, utgifven af Kongl. Vitterhets Historie och Antiquitets Akademien. Del. VII, Nr. 4.
- Atti della Reale Accademia dei Lincei. Ser. quarta. Vol. I, Fas. 25-27.
- From the SOCIETY.—Proceedings of the Royal Society. No. 239.
- Journal of the Society of Arts. Nos. 1725-29.
- Proceedings of the Royal Geographical Society. 1886, January.
- Proceedings of the Asiatic Society of Bengal. 1885, Nos. VI to VIII.
- Journal of the Asiatic Society of Bengal. No. 263.
- Bulletin de la Société de Borda, Dax. 1885, No. 4.
- Transactions of the Anthropological Society of Moscow. Vol. XXXIII, Appendix; Vol. XLIII, Part 2.
- Viestnik hrvatskoga Arkeologičkoga Društva. Godina VII. Br. 4.
- From the EDITOR.—Journal of Mental Science. New Series, No. 100.
- "Nature." Nos. 841-845.
- "Science." Nos. 147-151.
- American Antiquarian. Vol. VII, No. 6.
- Revue d'Ethnographie. Tom. IV, No. 4.
- Matériaux pour l'Histoire de l'Homme. 1885, Decembre.
- L'Homme. Nos. 21, 22.
- Archivio per l'Antropologia e la Etnologia. Vol. XV, Fas. 2.

The election of Mrs. C. BROOK (H.H. the Ranee of Sarawak) was announced.

MR. BRYCE WRIGHT exhibited an ancient bronze sword, found by the late Captain Sir William Peel, R.N., at Sandy, Bedfordshire.

MR. G. F. LAWRENCE exhibited some palæolithic flint implements found by him in gravels at junction of the Thames and the Wandle.

The following paper was read by the author:—

The ARCHÆOLOGICAL IMPORTANCE *of* ANCIENT BRITISH LAKE-DWELLINGS *and their relation to* ANALOGOUS REMAINS *in* EUROPE. By ROBERT MUNRO, M.A., M.D.

It appears to me that the time has now arrived when an effort should be made to interpret the historical value of the antiquities recovered from the sites of ancient lake dwellings, now so numerous discovered and recorded in this country. For the purpose of furthering this object I have prepared a short epitome of the main facts of these discoveries, together with certain inferences which they appear to me to suggest, with the view of eliciting the opinions of members of this Institute, many of whom are particularly competent to deal with the problem. However much variety or novelty may add to the interest attached to such discoveries, it must never be forgotten that their scientific value is to be determined by the extent to which they can be made to enrich our knowledge of the past phases of human civilisation. When we consider that ancient authors are not altogether silent on the habit which prevailed among some races of erecting wooden abodes in lakes and marshes, and that some of the Swiss lake villages were occupied as late as the Roman period, and that frequent references have been made in the Irish annals to stockaded islands, and that a similar custom is found to be still prevalent among some of the ruder races of mankind in various parts of the globe—it is somewhat remarkable that the investigation of these rich repositories of the remains of prehistoric man should have been so long overlooked.

To the late Sir W. R. Wilde we are indebted for the first systematic examination of any of the Irish crannogs. This was as early as 1839, and consequently preceded the discovery of the Swiss lake-dwellings by fifteen years.

The first examined was that of Lagore, in county Meath, full particulars of which are given in the first volume of the *Proceedings of the Royal Irish Academy*. After this other crannogs were discovered in rapid succession, and it soon became apparent that they existed very generally over the county. When Sir W. R. Wilde published his *Catalogue of the Museum of the Royal Irish Academy* in 1857, he states that no less than forty-six were known, and adds that he had no doubt that many others would be exposed to view as the drainage of the country advanced, a statement which has been amply verified because every succeeding year has seen an increase to their number.

According to this author crannogs “were not, strictly speaking, artificial islands, but cluans, small islets or shallows of clay or marl in those lakes which were probably dry in summer time,

but submerged in winter. These were enlarged and fortified by piles of oaken timber, and in some cases by stonework. A few were approached by moles or causeways, but, generally speaking, they were completely insulated and only accessible by boat; and it is notable that in almost every instance an ancient canoe was discovered in connection with the crannog. Being thus insulated they afforded secure places of retreat from the attacks of enemies, or were the fastnesses of predatory chiefs or robbers, to which might be conveyed the booty of a marauding excursion, or the product of a cattle raid."

A more recent explorer of Irish crannogs, Mr. W. F. Wakeman, thus writes:—"The Irish crannog, great or small, was simply an island, either altogether or in part artificial, strongly staked with piles of oak, pine, yew, alder or other timber, encompassed by rows of palisading (the bases of which now usually remain), behind which the occupier of the hold might defend themselves with advantage against assailants. Within the enclosure were usually one or more log houses, which no doubt afforded shelter to the dwellers during the night time or whenever the state of the weather necessitated a retreat under cover."

As indications of the social economy and industries of the occupiers of these crannogs were found a vast collection of articles made of stone, bone, wood, bronze, and iron; and within the last few years, according to Mr. Wakeman, many fragments of pottery of a similar character to the fictile ware used for mortuary purposes in the prehistoric and pagan period have also been found in some of them.

Soon after the discovery of the Irish crannogs, the attention of archæologists was directed to remains of lake-dwellings in Switzerland. It appears that during the winter of 1853-4 the inhabitants of Ober Meilen, near Zurich, took advantage of the low state of water in the lake to recover portions of the land, which they enclosed with walls, and filled in the space with mud. When the workmen began to excavate, they came upon heads of wooden piles, stone celts, stags' horns, and various kinds of implements. The late Dr. Ferdinand Keller, President of the Antiquarian Society at Zurich, hearing of the discovery, took up the matter with much energy, and after careful investigation of the remains at Ober Meilen, came to the conclusion that the piles had supported a platform, that on this platform huts had been erected, and that, after being inhabited for many centuries, the whole wooden structure had been destroyed by fire.

The discovery at Zurich was almost immediately followed by the discovery of similar structures in the other Swiss lakes. Owing to the vast system of drainage carried on since, there has been a great increase to their number, so that, at the present

time, it is well ascertained that there was scarcely a sheltered bay in any of the lakes of Switzerland and Central Europe, but contained a lake village. The most common plan adopted by the constructors of these ancient dwellings was to drive numerous piles of wood, sharpened sometimes by fire, sometimes by stone celts, or, in later times, by metal tools, into the mud near the shore of a lake; cross-beams were then laid over the tops of these piles and fastened to them either by mortises or pins of wood, so as to form a platform. In certain cases the interstices between the upright piles were filled with large stones, so as to keep them firmer.

Other erections were made by layers of sticks laid horizontally, one above the other, till they projected above the surface of the water, and thus presented a somewhat solid foundation for the platform. Upright piles here and there penetrated the mass, but rather served the purpose of keeping it together than of giving any support to the platform. These are called fascine-dwellings, and occur chiefly in the smaller lakes, and belong, for the most part, to the stone age.

The regular pile-buildings are far more numerous than the fascine-dwellings, but, notwithstanding the simplicity of the structure of the latter, they do not appear to be older than the former, and it is a matter of observation that the civilisation of the fascine-dwellers corresponds with that of the inhabitants of other settlements of the stone age—in fact, no difference has been observed between the earliest and the latest dwellings, except that the latter, as the result of improved tools, were constructed in deeper water.

From the remains found on the sites of these lacustrine villages, it is inferred that their occupiers were acquainted with agriculture, and grew wheat and barley; that they had domesticated animals, such as cats, dogs, pigs, oxen, horses, sheep, and goats; that they used as food, besides the flesh of domesticated and wild animals, fish, milk, corn-meal boiled or baked, hazelnuts, plums, apples, pears, sloes, blackberries, and raspberries; that they were acquainted with the principles of social government and the division of labour; that they made urns and culinary vessels from coarse pottery without a knowledge of the potter's wheel, as well as a variety of implements, weapons, and ornaments, of stone, bone, horn, wood, bronze, and iron; and that they manufactured cloth and ropes from bast and flax by means of looms, and the distaff and spindle. Their clothing consisted of skins of animals sometimes prepared into leather, as well as cloth plaited or woven from flax. Of the kind of huts or buildings erected over the platforms, little is known owing to their complete decay from exposure to sun and rain. They

appear to have been rectangular in shape, and formed of wattle or hurdle-work of small branches, woven between the upright piles and plastered over with clay. Each had a hearth formed of two or three large slabs overlying a bed of clay.

The earliest founders of these dwellings were, according to Keller, a branch of the Celtic population, who came into Europe as a pastoral people, bringing with them from the east the most important domestic animals. The absence of winter corn and hemp, of most of the culinary vegetables, as well as of the domestic fowl, which was unknown to the Greeks till about the time of Pericles, points to the period of their occupancy as a long way antecedent to the Christian era.

It was not till after these discoveries on the Continent had attracted universal attention that archaeologists began to look for similar remains in Britain. It was then found that early historic references to island forts, and some incidental notices of the exposure of buried islands artificially constructed of wood and stone, and other remains of lacustrine abodes, during the drainage of lochs and marshes in the last and early part of this century, had been entirely overlooked. The merit of correctly interpreting these remains in Scotland, and bringing them systematically before antiquaries, belongs to the late Joseph Robertson, Esq., F.S.A. Scot., who read a paper on the subject to the Society of Antiquaries of Scotland on the 14th December, 1857, entitled, "Notices of the Isle of the Loch of Banchory, the Isle of Loch Canmor, and other Scottish examples of the artificial or stockaded islands, called crannoges in Ireland, and Keltischen Pfahlbauten in Switzerland."

Mr. Robertson's paper, though not published, at once attracted attention, and stimulated so much further inquiry on the part of the members, that, at the very next meeting of the Society, another contribution on the subject was read by Mr. John Mackinlay, F.S.A. Scot., from which it appeared that as early as 1812 this gentleman had observed some remains (now surmised to be a crannog) in Dhu Loch, in the island of Bute, which were described in a letter dated the 13th February, 1813. This communication found its way to George Chalmers, Esq., author of "*Caledonia*," regarding which, writing on the 26th April, 1813, he says: "It goes directly to illustrate some of the obscurest antiquities of Scotland. I mean the wooden castles, which belong to the Scottish period when stone and lime were not much used in building. I will make proper use of this discovery of Mr. Mackinlay." In 1863, Dr. John Gigor, of Nairn, described "two ancient lake-dwellings or crannoges in the Loch of the Clans, Nairnshire." The remains, however, were too imperfect to be of value in illustrating their structure, and

the only relics found were a portion of a small stone cup or lamp, two whetstones, an iron axehead, and some charcoal and bits of bone.

A more important discovery, made about the same time, was a group of artificial islands in Loch Dowalton, Wigtownshire, which were first described by his Grace the Duke of Northumberland (then Lord Lovaine) in a paper read at the Newcastle-upon-Tyne meeting of the British Association in 1863. About two years later Mr. John Stuart, Secretary to the Society of Antiquaries of Scotland, visited Dowalton, and, owing to a greater drainage of the loch having been made in the interval, was enabled to re-examine the Dowalton islands under more favourable circumstances. The result of his labours was an elaborate paper to the Society, in which he gave a detailed account of the structure and relics of these crannogs, and also took the opportunity of incorporating into his article all the facts he could glean, so as to afford a basis for comparing the Scottish examples with those in other countries.

Since the publication of Dr. Stuart's paper in 1866, little progress was made in the investigation of Scottish crannogs, though traces of them were occasionally noticed in various parts of Scotland, till the discovery and examination of the Lochlee Crannog, Ayrshire, in 1878-9. The work done at Lochlee is important, not only because of the careful plans and sections made of the structure of the island, and the varied collection of relics secured, but because of the interest it has excited in archaeological research, the fruit of which is already being reaped in the discovery of no less than five other lake-dwellings in the south-west of Scotland, all of which have now, as far as practicable, been carefully investigated. Full details of these investigations are given in the collections of the Ayrshire and Galloway Archaeological Association, as well as in my recent work on the Scottish Lake-Dwellings.

South of the Scottish border the remains of lake-dwellings, though not so numerous as those recorded in Ireland and North Britain, are sufficiently important to claim a passing notice. As early as 1856 Sir Charles F. Bunbury described certain oak piles and cut portions of deer horns, evidently manipulated by human agency, which were discovered imbedded in the moss of a drained *mere* near Wretham Hall, Norfolk; and in 1866 General Pitt Rivers read a lengthy paper at the Anthropological Society, entitled, "A Description of Certain Piles found near London Wall and Southwark, possibly the remains of Pile-Buildings." Among the relics here collected were Samian and other pottery, bronze and iron implements, leather soles of shoes, and a variety of Roman coins. Other remains, supposed to

indicate the sites of former lacustrine abodes, are recorded as having been found in Llangorse Lake, South Wales, Barton Mere, near Bury St. Edmunds, &c., and quite recently in the Holderness district near Hull. (See "Ancient Scottish Lake-Dwellings," &c.).

While such general indications of lake-dwellings can hardly be said to limit their geographical distribution to any given area in Britain, it is a singular fact that, so far as the discovery of actual remains illustrative of the civilisation and social condition of their occupiers is concerned, we are almost entirely dependent on the investigation made at Dowalton, Lochlee, Lochspouls, Buston, Arricouland and Barhapple, all of which are within the counties of Ayr and Wigtown. In instituting a comparison between these groups their analogy, not only as regards the structure and local distribution of the islands, but as regards the general character of the relics, is so wonderfully alike that we have no difficulty in dispensing with the necessity of discussing the merits of each group separately; so that whatever inferences can be legitimately derived from a critical examination of any one group may be safely applied to the whole.

All the wooden islands hitherto examined in Scotland appear to have been built after an uniform plan, the main objects of which were to give stability to the island, to afford fixed points, *points d'appui*, on its surface, and to prevent the superincumbent pressure of whatever buildings were to be erected on it from causing the general mass to bulge outwards. Having fixed on a suitable locality—the topographical requirements of which seemed to be a small mossy lake, with its margin overgrown with reeds and grasses, and secluded amidst the thick meshes of the primeval forests—the next consideration was the selection of the materials for building the island. In a lake containing the soft and yielding sediment due to decomposed vegetable matter, it is manifest that any heavy substances, as stones and earth, would be totally inadmissible owing to their weight, so that solid logs of wood, provided there was an abundant supply at hand, would be the best and cheapest material that could be used. To construct in 10 or 12 feet of water, virtually floating over an unfathomable quagmire, a solid compact island, with a circular area of 100 feet or more in diameter, and capable of enduring for centuries as a retreat for men and animals, was no mean problem to contend with, even from the point of view of a skilful modern engineer, and yet the execution of this work in these early times is actually the outcome of the highest mechanical principles that the circumstances would admit of.

The general plan adopted was to construct an island of fascines, stems of trees and brushwood laid transversely, mingled

with stones and earth. This mass was pinned together towards the margin by a series of stockades which were firmly united by intertwining branches, or in the more elegantly constructed crannogs by horizontal beams with mortised holes to receive the uprights. These horizontal beams were arranged in two ways. Some lay along the circumference and bound together all the uprights in the semi-circle, while others took the radial position and connected each circle together. The external ends of these radial beams were occasionally observed to be continuous with additional strengthening materials, such as wooden props and large stones, which, in some cases, also appeared to act as a breakwater. Frequently a wooden gangway, probably submerged, stretched to the shore, by means of which secret access to the crannog could be obtained without the use of a canoe. These gangways were most ingeniously constructed, but there has been no evidence to show that the uprights supported a superaqueous platform.

The great value, however, of the investigations of the lake-dwellings in the south-west of Scotland depends on the quantity and variety of the remains of human industry discovered in and around their sites. It is from such fragmentary evidence as is supplied by food-refuse, stray ornaments, broken weapons, useless and worn-out implements, and such-like waifs and strays of human occupancy, that archaeologists attempt to reconstruct the outlines of the social life and organisation of the prehistoric past. To those who may wish to occupy themselves with this problem these explorations furnish a vast collection of objects made of stone, bone, horn, wood, bronze, iron and gold.

Among the stone objects are—querns, hammer-stones, whet-stones, so-called sling-stones, a few cup-marked stones (one surrounded by concentric circles), spindle-whorls, flint flakes and scrapers, a polished celt, a perforated axe-hammer head, portions of two polished circular discs, and an oval implement with two wrought hollowed surfaces.

Bones and the horns of deer were utilised in various ways and manufactured into pins, needles, bodkins, awls, picks, toilet-combs, knife handles, &c. The combs are neatly formed of three or four flat pieces kept in position by two transverse slips, one on each side, and rivetted together by iron rivets. They are ornamented by a series of incised circles, which are sometimes connected by a running scroll.

The wooden articles consist of bowls, ladles, a mallet, a hoe, clubs, &c., together with a variety of other objects apparently intended for agricultural purposes.

Implements and weapons of iron are numerous; amongst the former are gouges, chisels, knives, shears, saws, hatchets, awls,

hammers, a bridle bit (partly iron and partly bronze), the bolt of a padlock and other objects of unknown use. The weapons consist of leaf-shaped spearheads, both socketed and tanged, daggers and arrowheads resembling those of the crossbow bolt.

The objects made of bronze are mostly of an ornamental character, comprising:—harp-shaped fibulæ, one circular and one penannular brooch, finger rings, a doubly spiral ornament, ornamented pins, one with a ring top, and another with a glass setting, a small key, and some other articles of an indeterminate character. From Dowalton there are basins or caldrons of beaten bronze, and some clouted and rivetted, one of which, presumably of a Roman saucepan, has the name of the maker on the handle.

On the Buston crannog were found too handsome and massive spiral finger-rings made of gold. One is plain with five-and-a-half twists; the other, besides an additional twist, has both ends ornamented by a series of circular grooves. From the same place there is a curious gold coin, supposed by Mr. Evans to be of Saxon origin, and a forgery of the sixth or seventh century.

Pottery is represented by numerous fragments, some of which are of so-called Samian ware, but the most of them are of vessels of a glazed ware while a few are of an archaic type. Several neatly formed crucibles, containing traces of slag, are also in the collection.

Among miscellaneous objects are trinkets made of variegated glass or vitreous paste, such as bracelets and beads; also some jet ornaments, one of which is a handsome pendant in the form of an equal-armed cross, inscribed in a circle, and having one surface ornamented by a series of incised circles which contain the remains of a yellow enamel. Dr. Joseph Anderson considers this a Christian relic of a very early type. A smooth and flat piece of ash wood, with peculiar spiral carvings on both sides, and a fringe-like apparatus made of the long stems of a moss, are among the objects which have excited the greatest curiosity. Regarding a finely polished conical object made of rock crystal found at Lochspouts, a reviewer in the "*Academy*," October 14th, writes: "Is it a charm, or can it have formed the centre knob or boss in the binding of some richly decorated breviary or gospel book? Crystals very similar, but oblong in form—like a Brazil nut—may be seen in some of the rich covers of books of early date, and a few that have been detached are preserved in collections. One such object forms part of a crystal necklace in the Ashmolean Museum, and another in private hands was employed, not so very many years ago, in the West Riding of Yorkshire, for the purpose of seeing spirits. If this relic be, indeed, a book-boss, it makes it probable that

the crannog was at one time inhabited, or at least visited, by Christian missionaries." Dr. Joseph Anderson has also pointed out that this object is extremely like a "large circular rock crystal which forms the central ornament on the inferior surface of the foot of the famous silver chalice, dug up at the Rath of Reerosta, near Ardagh, county Limerick, Ireland, 1868, and now in the Museum of the Royal Irish Academy, Dublin. According to the Earl of Dunraven, this most beautiful example of our ancient art was executed either in the ninth and tenth century." (See "*Proceedings Soc. Antiq. Scot.*," December 4th, 1882.)

Let us now look at the remarkable series of implements, weapons, ornaments, and nondescript objects here presented to us, with the view of abstracting from them some scraps of information regarding their original owners. The fragments of Samian ware, bronze dishes, harp-shaped fibulæ, and the large assortment of beads, bronze and bone pins, bone combs, jet ornaments, &c., are so similar to the class of remains found on the excavated sites of Romano-British towns, that there can hardly be any doubt that Roman civilisation had come in contact with the lake-dwellers. The Celtic element is, however, strongly developed, not only in the general character of many of the industrial implements of stone, bone, and iron, but also in the style of art manifested in some of the ornamental objects included in the collection. Thus the piece of ash wood with its carved spiral patterns, the combs, especially the one showing a series of concentric circles connected by a running scroll design, the table-man, from the Loch of Forfar, carved with similar circles and an open interlaced knot-work, and some of the bronze brooches and ornaments, present a style of ornamentation which is considered peculiar to Celtic art. The spiral finger-rings seem also to have been of native origin, and the probability is that they were manufactured where they were found, as several crucibles are amongst the relics from the same lake-dwelling, one of which, from the fact that it still contains particles of gold, proves that it had been used in melting this metal.

On the other hand, the forged gold coin is the only relic that can with certainty be said to have emanated from a Saxon source—at least, that cannot otherwise be accounted for.

But if from internal evidence a presumptive case is made out in favour of the Celtic origin and occupation of these lake-dwellings, it is greatly strengthened when we consider that the neighbouring Celtic races in Scotland and Ireland were in the habit of erecting similar island abodes, while there is not a particle of evidence in favour of the idea that such structures

originated with the Roman conquerors of Britain, or its Saxon invaders.

The resemblance between the remains found in the Scottish and Irish lake-dwellings, as well as other antiquarian finds of Celtic character, must also not be overlooked. Combs, similar in structure and ornamentation to those from Buston, have been found in several of the Irish crannogs, in the brochs and other antiquities of the north of Scotland, and in many of the ruins of the Romano-British towns in England. Iron knives and shears, variegated beads of impure glass with grooves and spiral marks, and ornaments of jet and bronze, implements of stone, bone, and horn, besides querns, whetstones, &c., are all common to Celtic antiquities wherever found.

Canoes are so invariably found associated with crannogs, that their discovery in lakes and bogs has been considered by Dr. Stuart as an indication of the existence of the latter. This may be true in some cases, but in others, such as Closeburn, Lochwinnoch, and Loch Doon, three of the examples cited by him, it is more probable that the canoes were used by the occupiers of the mediæval castles in the vicinity of which they were found. From these and other instances that have come under my notice I have come to the conclusion that dug-out canoes do not indicate such great antiquity as is commonly attributed to them nor do they therefore necessarily carry us back to prehistoric times.

While some fragments of the pottery collected on the Ayrshire crannogs (all of which include Samian ware) are undoubtedly Romano-British, others as certainly point to a different period and source. I am informed on good authority that all the portions showing remains of glaze were manufactured in mediæval times, but on the other hand that some others might belong to the same class of fictile ware as was used for mortuary purposes in pagan times.

From the respective reports of Professors Owen, Rolleston, and Cleland, on a selection of osseous remains taken from the lake-dwellings at Dowalton, Lochlee, and Buston, we can form a fair idea of the food of the occupiers. The Celtic short-horn ox, the so-called goat-horned sheep, and a domestic breed of pigs were largely consumed. The horse was only scantily used. The number of bones and horns of the red-deer and roebuck showed that venison was by no means a rare addition to the list of their dietary. Among birds, only the goose has been identified, but this is no criterion of the extent of their encroachment on the feathered tribe, as only the larger bones were collected and reported on. To this bill of fare the occupiers of Lochspouts crannog, being comparatively near the sea,

added several kinds of shell-fish. In all the lake-dwellings that have come under my own observation the broken shells of hazel nuts were in profuse abundance.

From the number of querns, and the great preponderance of the bones of domestic over those of wild animals, it may be inferred that, for subsistence, they depended more on the cultivation of the soil and the rearing of cattle, sheep, and pigs, than on the produce of the chase.

Proofs of a prolonged but occasionally interrupted occupancy are also manifested by the great accumulation of *debris* over the wooden pavements, the size and contents of the kitchen-middens, and the superimposed hearths.

That many of these relics were the products of a refined civilisation, is not more remarkable than the unexpected and strangely discordant circumstances in which they have been found. For this reason it might be supposed that the crannogs were the headquarters of thieves and robbers, where the proceeds of their marauding excursions among the surrounding Roman provincials were stored up. The inferences derived from a careful consideration of all the facts do not appear to me to support this view, nor do they uphold another view sometimes propounded, viz., that they were fortified islands occupied by the guardian soldiers of the people. Indeed, amongst the relics military remains are only fully represented by a few iron daggers and spearheads, one or two doubtful arrow-points, and a quantity of round pebbles and so-called sling-stones. On the other hand, a very large percentage of the articles consists of querns, hammer-stones, polishers, flintflakes, and scrapers; stone and clay spindle-whorls, pins, needles, bodkins, and knife-handles; bowls, ladles, and other domestic vessels of wood, some of which were turned on the lathe; knives, cans, saws, hammers, chisels, and gouges of iron; several crucibles, lumps of iron slag, and other remains of the metallurgic art. From all these, not to mention the great variety of ornaments, there can be no ambiguity as to the testimony they afford of the peaceful prosecution of various arts and industries by the lake-dwellers.

There is, in my opinion, only one hypothesis that can satisfactorily account for all the facts and phenomena here adduced, viz., that the lake-dwellings in the south-west of Scotland were constructed by the Celtic inhabitants as a means of protecting their lives and movable property when upon the frequent withdrawal of the Roman soldiers from the district they were left, single-handed, to contend against the Angles on the east, and the Picts and Scots on the north. It is not likely that these rich provincials, so long accustomed to the luxury and comforts of Roman civilisation, or their descendants in the sub-

sequent kingdom of Strathclyde, would become the assailants of such fierce and lawless enemies, from whom, even if conquered, they could derive no benefit. Hence their military tactics and operations would assume more the character of defence than aggression, and in order to defeat the object of the frequent and sudden inroads of the northern tribes, which was to plunder the inhabitants rather than to conquer the country, experience taught them the necessity of being prepared for emergencies by having certain places of more than ordinary security where they could deposit their wealth, or to which they could retire as a last resource when hard pressed. These retreats might be caves, fortified camps, or inaccessible islands, but in localities where no such natural strongholds existed the military genius of the Celtic inhabitants, prompted perhaps by inherited notions, led them to construct these wooden islands. Since the final departure of the Romans till the conquest of the kingdom of Strathclyde by the Northumbrian Angles, a period of several centuries, this unfortunate people had few intervals of peace, and with their complete subjugation ended the special function of the lake-dwellings as a national system of protection. No doubt some of them, as well as caves and such hiding-places, would continue to afford refuge to straggling remnants of natives rendered desperate by the relentless persecution of their enemies, but ultimately all of them would fall into the hands of their Saxon conquerors when henceforth they would be allowed to subside into mud, or crumble into decay. If the number and localisation of the sites of Scottish lake-dwellings, as known up to the present time, be taken as a fair representation of their former geographical distribution, we must limit their area to those districts in possession of the Celtic people during or immediately after the Roman occupation of Scotland. Thus, adopting Skene's division of the four kingdoms into which Scotland was ultimately divided by the contending nationalities of Picts, Scots, Angles, and Strathclyde Britons, after the final withdrawal of the Romans, we see that of the crannogs proper none have been found within the territories of the Angles; ten and six are respectively within the confines of the Picts and Scots; while no less than twenty-nine are situated in the Scottish portion of the ancient kingdom of Strathclyde. That they have not been found in the south-eastern provinces of Scotland may suggest the theory that these districts had been occupied by the Angles before Celtic civilisation gave birth to the island dwellings. But whatever may have been the exigencies, whether social or military, that led to the development of the crannogs in the south-west of Scotland, there can be no doubt that none of their remains hitherto brought to light

give any countenance to the presumption of a pre-Roman occupation.

A reviewer in the *Pall Mall Gazette* takes exception to this opinion on the grounds that amongst the relics are a polished stone celt of neolithic type, flint scrapers which, he says, "may be of the bronze age, but could hardly be considered as post-Roman," and portions of the antlers of the reindeer which, according to him, "can hardly have ranged so far south at any period later than the neolithic age." Whatever explanation may be forthcoming as to the prevalence of such relics in these crannogs, there is no possibility of denying that all of them hitherto examined in this locality were constructed during the iron age. Not only have iron implements and weapons, including hatchets, chisels, gouges, and a cross-cut saw, been found associated with Roman remains, as well as a few of the still older types of relics, but in one instance an Anglo-Saxon coin of the sixth or seventh century. Moreover, the very lowest of the logs of which the Lochlee crannog was constructed bore unmistakable evidence of having been manipulated with sharp metal tools. The entire absence of cutting instruments of bronze renders it more than probable that those tools were made of iron, and were similar to those so abundantly found on the crannog. Had my reviewer read the remarks in my book at page 116, regarding this polished greenstone hatchet, he would hardly have selected it to prove that the Lochlee crannogs existed during the neolithic age. My words are: "As many of the relics, if judged independently of the rest and their surroundings, would be taken as good representatives of the three so-called ages of Stone, Bronze, and Iron, it is but natural for the reader to inquire if superposition has defined them by a corresponding relationship. On this point I offer no dubious opinion. The polished stone celt, Fig. 55 (that referred to by my reviewer), and the (iron) knife, Fig. 129, were found almost in juxtaposition about the level of the lowest fireplace." As for the conclusions educed from the horns of the reindeer (hesitatingly identified by the late Professor Rolleston), it is now actually proved that this animal was not extinct in Scotland before the twelfth century. In the "*Orkneyinga Saga*" it is stated that "every summer the Earls were wont to go over to Caithness, and up into the forests, to hunt the red-deer or the reindeer." The recent discovery of its bones and horns in refuse heaps in Caithness, and in many of the brochs in the north of Scotland, amply proves that the reindeer was hunted and eaten by the Norsemen as late as the above date.

Turning now to the Celtic area beyond the limits of the Scottish portion of the kingdom of Strathclyde, we find no data,

either from an examination of its artificial islands or any relics of their occupiers, which can give even an approximate idea of their chronological range.

In localities where the Celtic races were not supplanted by foreigners, it would be strange indeed, and altogether at variance with archaeological experience, if the habit of resorting to isolated and inaccessible islands for safety would be all at once abandoned whenever the greater security afforded by stone buildings became known. Hence, in the Irish annals, we find frequent mention made of crannogs down even to the middle of the seventeenth century, and Dr. Robertson has quoted several historical passages to prove that certain crannogs in Scotland—for example, those of the Loch of Forfar, Lochindorb, Loch Canmor, and Loch-an-eilan survived to the middle ages. Many of these, however, were strong mediæval castles, which had nothing in common with the crannogs proper beyond the fact of their insular situation.

From an etymological analysis of the earliest topographical nomenclature of Britain, it is inferred that in former times the whole island was nearly occupied by a Celtic population which was ultimately driven, by successive waves of immigrants, to the far north and west. Hence it becomes an important inquiry to determine if, in those localities from which the Celts were expelled, there still exist any traces of lake-dwellings. That they have not been found in the south-eastern provinces of Scotland may be due to the rarity of suitable lakes, or to the want of careful research on the part of antiquaries.

Taking into account the recent discovery of lacustrine dwellings in the Holderness district, and the few previous records by trustworthy observers of the existence of similar remains in England and Wales, together with the distinct statement made by Julius Cæsar that the Britons were in the habit of making use of wooden piles and marshes in their mode of entrenchment, I am inclined to believe that such remains are not merely solitary instances, but the outlines, as it were, of a widely distributed custom which prevailed in the southern parts of Britain at an earlier period than that assigned to the crannogs of the south-west of Scotland. Hence I have been led to suggest, as a tentative theory, that the original British Celts or Gaels were an offshoot of the founders of the Swiss lake-dwellings who emigrated to Britain when these lacustrine abodes were in full vogue and retained a knowledge of this custom long after it had fallen into desuetude in Europe. On this hypothesis it would follow that subsequent immigrants into Britain, such as the Belgæ, Angles, &c., being no longer acquainted with the subject, would cultivate new or perhaps improved principles of defensive warfare; whilst the first Celtic invaders, still retaining their primary

notions of civilisation, when harassed by enemies and obliged to act on the defensive, would naturally have recourse to their inherited system of protection, with such variations and improvements as better implements and the topographical requirements of the country suggested to them. It is as defenders, not as conquerors, that the Celts constructed their lake-dwellings.

This hypothesis has elicited a considerable diversity of opinion from a few of my critics. In the *Times* of October 4th, 1882, it is thus referred to: "The weakest part of Dr. Munro's volume is that in which he endeavours to prove a connection between the Celts of Britain and the builders of the Swiss lake-dwellings. This is pure theory, and is quite unnecessary to account for the facts; as well might one argue a connection between the pile-dwellers of New Guinea and Central Africa and those of the Swiss lakes." Sir John Lubbock also (*Nature*, December 24th, 1882) confesses that he is disposed to doubt that there is any connection between the geographical distribution of Scottish lake-dwellings at present known and that of the ancient Celts. On the other hand, another reviewer (in the *Scotsman* of November 22nd, 1882, who, in my opinion, displays a most thorough and critical knowledge of the whole subject of lake-dwellings) attempts to defend my conjectures by the following arguments:—"This is not a hypothesis which is altogether destitute of indications to support it. The Swiss lake-dwellers, according to Keller, were a branch of the Celtic people. Their regular pile villages did not resemble the crannogs of Scotland and Ireland, but their fascine-dwellings were constructed precisely in the same manner and on the same principles as the crannogs. Like these they chiefly occur in the smaller lakes, but unlike them they belong entirely to the stone age. In the Swiss lake-dwellings of the iron age, however, there are indications, especially in the ornamentation of the sword-sheaths and other articles, of a style of art which closely corresponds to the style of decoration prevalent in the crannogs of Scotland and Ireland. Such indications as these are, perhaps, too feeble to be taken as evidence; but, so far as they go, they give some countenance to the hypothesis which Dr. Munro enunciated."

Perhaps this is all that can at present be fairly urged in support of the hypothesis from a comparison of the relics. There are, however, some collateral circumstances involved in its consideration that seem to me to require more careful attention and extended research on the part of archaeologists before the problem can be finally disposed of. Thus, for example, the geographical distribution of lake-dwellings, so far as they are known in Europe, very nearly corresponds with the area formerly occupied by the Aryan or Indo-European people, commonly called Celts, in their

several westward waves of emigration. Hitherto no lacustrine habitations have been discovered in Europe north of France and South Germany, nor on the other hand in the Siberian Peninsula. Of course in districts where there were no natural lakes it could not be expected that lake-dwellings would be found, and hence the inhabitants, of such localities must have had recourse to some other means of defensive warfare. I have already suggested that such topographical considerations may partly account for the marked disparity in the lake-dwellings in the eastern and western districts of the south of Scotland. Their entire absence, however, from the northern and southern regions of Europe, can hardly be accounted for by a deficiency in their topographical and hydrographical requirements for such structures. This singular coincidence of such a well-defined class of antiquities as the lake-dwellings with the ethnographical range of the people supposed, on outside evidence, to be their founders, is a striking contrast to the break-down of the theory which formerly assigned to the same people another localised group of European antiquities, viz., the dolmens and other megalithic monuments. As regards these monuments their geographical distribution is the strongest argument against their Celtic origin, because, instead of coinciding with, it actually crosses, the Celtic area at right angles, and includes North Germany, Scandinavia, Holland, France, the British Isles, Spain and Portugal, together with an extensive region in North Africa.

As to a supposed difference in structure I need only refer to the structural details of the fascine-dwelling in the lake of Fuschl, near the Mondsee, Austria, as a sufficient proof of the exact resemblance between it and the Scottish and Irish crannogs. It is true that the pile-dwellings were more numerous on the continent than the fascine structures, while the reverse was the case in Scotland and Ireland—if indeed the former can be said to have existed at all in these countries. That the pile system was, however, known to the crannog builders, and occasionally acted upon, we are not devoid of some positive evidence. Mr. G. H. Kinahan, M.R.I.A., says that a few of the Irish crannogs were built on piles (Keller's "*Lake-Dwellings*," p. 654, 2nd Ed.) and instances an example in Loch Cimbe (now Loch Hackett), county Galway, which was so frequently blown down that the occupiers were obliged to convert it into an island, which they did by adding boat-loads of stones to its site. On the 30th August, 1882, I examined two lake-dwellings in Lough Mourne, Ireland, which shortly before became exposed owing to its partial drainage while converting its basin into a reservoir as a water supply for the town of Belfast. One of these I concluded to have been a pile-dwelling. The piles were closely set, about 1 to 1½ foot apart,

and occupied the whole area of the dwelling, covering a space of about 50 yards in diameter. A thin layer of burnt faggots and charcoal, but no fascines of any kind, were found among the stumps of the decayed piles, and only a few inches below the sand and mud. In two spots, near the centre, there were some stones and clay mixed with ashes and flint chips, as if they had been fireplaces. The superstructure had evidently been burnt down, and the clay and stones which served as the fireplaces had consequently dropped to the bottom of the lake without much transposition of their relative positions. Two lines of piles, as if intended for a gangway, extended to the shore. Some of the examples of lake-dwellings recorded in England would appear also to have been pile structures.

If, therefore, both principles were known among the crannog builders of the British Isles, why, it may be asked, did they give a preference to the fascine structures? I have already remarked that these structures on the Continent were always found in small mossy lakes, which, owing to the yielding nature of the peaty deposits, were unsuitable for the support of platforms bearing huts and other superstructures. In such conditions the artificial island supplied more readily, and perhaps with less labour, the requisite stability, especially when the dimensions of the platform were small and sparsely placed.

The comparatively late occupancy of the Scottish and Irish crannogs is also supposed to militate against the supposition of there being any ancestral connection between their founders and those of their analogues in Central Europe. But this chronological gap is more apparent than real. Not only were there many lake-dwellings in Switzerland belonging to the iron age, but, in several instances, Roman remains were associated with them. Among the antiquities collected on the site of the pile-dwellings, at Paladru, near Voiron, France, were horse-shoes, currycombs, axeheads, spurs, keys, spear-heads, &c., all made of iron, as well as many other objects of wood, bone, and pottery, which, in the opinion of M. de Mortillet and other archaeologists, could not be accounted for as the products of any civilisation prior to Carlovingian times.

Taking all the circumstances into consideration, I repeat that we are justified in ascribing the remains of lake-dwellings, so far as they are at present known within the British Isles, to a Celtic source; and if Dr. Keller is right in assigning those of Central Europe to a branch of the same people, I see no *primâ facie* improbability, so far as their distribution either in space or time is concerned, against the hypothesis which I have here ventured to formulate.

DISCUSSION.

MR. GEORGE M. ATKINSON desired to remind Dr. Munro that all crannogs were not artificially formed islands. At the top of the Bay of Ardmore, in the south of Ireland, owing to geological changes, in the summer of 1878, the piled remains of a circular crannog in the bed were uncovered. It is about 100 feet in diameter, and consists of two approximately concentric rows of piles about 13 feet apart, on which we may presume the platforms and huts of the inhabitants were formerly erected, the central part being a kind of little harbour agreeing exactly with the descriptions of the dwellings of the Nicobar and other Polynesian Islanders. This crannog has been described by Mr. R. J. Ussher in the Proceedings of the Royal Irish Academy for December, 1880, but the speaker's observation did not coincide with the conclusions of this writer. Mr. Atkinson did not think Dr. Munro could support any theory of races from these structures, which appeared to have rather the result of the expediency of existence. They are not found further north in Europe than some lakes in Mecklinburg Schwerin, the ice of winter rendering their utility valueless.

MR. A. L. LEWIS said, if the erection of the crannogs were so late as the author appeared to think, there could hardly have been any direct connection between their builders and those of the Swiss lake-dwellings. From the account given of the remains found in the crannogs he was disposed to attribute their first erection to a much earlier period, although they might have been occupied up to a comparatively late date, and in that case there might have been some sort of connection between the first builders in Switzerland and in Britain. The similar use of sites and materials under similar circumstances was, however, no proof of unity of origin unless it were carried into details unlikely to occur to different minds except from a common influence; this remark applied also to the megalithic monuments, which, however, so far as they existed in countries now or formerly Celtic, he believed to have been erected for the most part, by the Celtic populations. Some of the piles found in London Wall rested on heaps of Roman pottery, and Mr. Lewis therefore thought it more likely that they had supported some mediæval structure than that they had formed part of a post-Roman lake-dwelling.

MR. RUDLER called attention to the fact that by far the larger number of the lacustrine habitations discovered in Ireland occur in the province of Ulster, and therefore not far from the south-western part of Scotland, which has yielded the crannogs described by Dr. Munro. According to Colonel Wood-Martin, out of a total of 221 sites of lake-dwellings known in Ireland, 124 occur in Ulster. This fact in the geographical distribution of crannogs is not without significance in discussing the ethnical relations of their builders.

The following paper was read by the author:—

On THREE STONE CIRCLES in CUMBERLAND, with some further observations on the RELATION of STONE CIRCLES to ADJACENT HILLS and OUTLYING STONES. By A. L. LEWIS, F.C.A., M.A.I.

[WITH PLATE XX.]

ABOUT four years ago I had the honour of reading a paper before this Institute on the "Relation of Stone Circles to Outlying Stones or Neighbouring Hills," which was printed in the *Journal* for November, 1882. In that paper I showed, from an examination of eighteen stone circles in England and Wales, and the bearing from them either of single stones or of other circles, or of prominent hills, that there was in that particular a very marked preponderance of relation or reference to the north-east (the quarter in which the sun rises in this country at midsummer); the quarters which took the second and third places, though at a considerable distance, being the south-east and south-west; so that we may take the line south-west to north-east as being specially characteristic of circles, in opposition to the line north-west to south-east, which is most usual in stone chambers and similar purely sepulchral monuments.

Since that paper was published I have visited three well-known circles in Cumberland, and as what I have observed in connection with them, although not precisely what I expected, is even more remarkable than I had anticipated, I propose in the first place to describe those circles and their surroundings to you as briefly as I can, then to group the results obtained from them with those stated in my former paper, and, in conclusion, to make some general observations on the subject.

The largest circle in Cumberland is "Long Meg and her Daughters," about seven miles north-east from Penrith. It consists of about seventy stones of various sizes, of which only twenty-seven are now erect, forming a rather irregular oval, 305 feet from north to south, and 360 feet from east to west, having a clearly marked special entrance to the south-west, indicated by two stones placed outside the others, one on each side of the entrance; this entrance leads directly to the largest stone of the group, "Long Meg" itself, which is 13 feet high, and stands as nearly as possible due south-west from the centre of the ring, about 250 feet from that point, and 80 from the circumference. Although the entrance and outlying stone, which are the most remarkable features of this circle, stand to the south-west, instead of the north-east, they are in the same general line, south-west to north-east, of which I have previously spoken, and there is, I

think, great reason to believe that a stone or stones formerly stood not exactly north-east from the centre of the circle, but about 60 degrees, or two-thirds of the way, north from east. About 1,100 feet from the centre of the circle in this direction I noticed a peculiar projecting angle in a fence which appears to have been ~~run~~ out to that point as though some landmark had formerly stood there, and, at this angle, at the foot of the hedge, was a loose stone, about 3 feet by 2 by 1, while another smaller but considerable fragment was built into a fence close by.

After I had written the sentences I have just read, I was placed in communication with Mr. Jared Turnbull, schoolmaster, of Maughanby, who has kindly made inquiries amongst the oldest inhabitants, and has found two old men who remember the small stone at the angle I have just mentioned from their boyhood, so that it is not a recent deposit. One of these men also remembers a small standing stone close by. Mr. Turnbull has since found other stones close by this spot, some broken and some buried, but whether *in situ* or not is uncertain. These may have formed part of a "circle of twenty stones 50 feet diameter, and at some distance above it a single stone regarding it as Long Meg does her circle," of which Stukeley speaks, but in a manner which would lead to the belief that it was further away from Long Meg; whether, however, it was a circle (and Mr. Turnbull thinks that the one mentioned by Stukeley must have been close by) or whether it were only one or more stones that stood there, the north-easterly position in reference to Long Meg would be the same, and I therefore register Long Meg as showing certain references to the south-west and north-east. I have taken you at some length through the various steps by which I have been able first to suspect, and then to establish, the former existence of these stones, because I think there can be no better proof of the persistence of the north-easterly reference in the circles than that a belief in it should have enabled me to restore the memory of these stones, all knowledge of which would otherwise perhaps have been lost.¹

There may, however, possibly have been another north-easterly reference at Long Meg; 27 degrees north of east, and 638 yards from the centre of that circle (according to Mr. Dymond's measurement), are eleven stones of good size, close to each other, and forming in their present position a sort of horse-shoe, surrounding

¹ Camden says of Long Meg (1557): "Inside the circle are two heaps of stones under which they say the bodies of the slain were buried." These heaps had nearly disappeared in Stukeley's time (1750), and no traces of them are to be found now. It is not unlikely that interments may have been made inside the ring; but I do not for a moment believe that sepulture was its principal object.

a hole which formerly contained a cist. Up to about twenty years ago these stones were almost covered with earth and cobble stones, which were then removed to be put on the surrounding field, the cist being uncovered and destroyed. The Rev. J. Simpson, in describing its discovery to the Society of Antiquaries, in January, 1866, stated that an urn of very coarse material and not ornamented, which fell to pieces, was found in the cist, and was full of burnt bones and charcoal, that the cist also was full of black earth different from that outside, but that nothing else was found. An observation which bears more particularly on the point I have in view I give in his own words: "As most of the large stones forming the circle were covered with earth, and all of them partly so, it is not too much to infer that the circle of stones may first have existed, that the cist was formed and the urn containing burnt bones and charcoal deposited therein, and the cairn over them formed at a later period than when the stones were first placed in the circle." If this were so we should have this little circle about 18 feet in diameter (some of the stones of which, however, would have been 6 feet high), standing 27 degrees north of east from Long Meg, and possibly forming with it and the other circle mentioned by Stukeley, the remains and approximate site of which I have already spoken of, a system of circles somewhat resembling those at Stanton Drew, in Somersetshire, in character, though differing from them considerably in details of arrangement. A circumstance which makes it more probable that this little circle was, as Mr. Simpson suggests, originally uncovered, is that on the stone nearest the north-east are the faint remains of a concentric marking and a spiral marking which would have been less likely to have been cut on a stone which was intended to be buried than on one which was intended to be exposed. There are also concentric markings on "Long Meg" herself. Another point is that, if this circle were originally uncovered and were at a later period thrown down and covered up to form a tomb, its original construction must have been very early, since the interment itself was not of a very late type.¹

The next circle which I have to draw your attention to is a mile and a half east from Keswick. It is known as the "Druids' Temple," and consists at the present time of forty-eight stones; it is about 105 feet in diameter from north to south, by 95 feet from east to west, and it occupies the grandest position in which I have ever seen a circle placed. Standing in the

¹ Mr. Simpson also says: "In an adjoining field nearer to Long Meg there appears to have been another stone circle, but I could not learn whether there had been a cairn, and if so when and by whom it was removed." This was probably Stukeley's circle already mentioned.

centre, and looking northward through what seems to have been the entrance, the visitor sees a gap or valley flanked by Skiddaw on the north-west and by Blencathra on the north-east; these gigantic sentinels being only from three to four miles away, and rising about 2,000 feet above the level of the circle, not only without any intervening hills to dwarf their height, but with an intervening valley to increase it, are by far the most striking objects in the surrounding landscape; their summits are not exactly north-east and north-west from the centre of the circle, but about ten degrees north of those points. Had the circle been placed further north so as to bring those summits to true north-east and north-west it would have stood upon much lower ground, and the view from it in other directions would have been spoiled; still it stands so symmetrically in relation to those two hills that it can hardly be doubted that its builders selected the site with special reference to them. There is, moreover, a stone (7 or 8 feet long by 4 wide) lying prostrate in a lane perhaps 100 feet north-west from the circle: this stone has not, so far as I know, been noticed by any one else, but it no doubt formerly stood erect either at true north-west or in line with the summit of Skiddaw a little north of true north-west. There was most likely a similar stone to the north-east, but I could find no traces of it, so suppose that if it ever existed it has been buried or broken up. The summit to the north-east, Blencathra, it must be remarked, presents a triple peak as seen from the circle; while that to the north-west, Skiddaw, presents only a single peak. The hills in other directions, though inexpressibly beautiful, exhibit no such striking features as those already noticed; they are either lower, or further off and masked by intervening but smaller masses, and often hidden by clouds and mist. The highest stone in the circle ($7\frac{1}{2}$ feet high) stands about as much north from south-east from the centre as Blencathra is north from north-east, and, looking over it, the eye rests upon a summit. There is also a notable summit about true west, one about ten degrees north of east, and another about seven miles due south; but the others, which are many, do not stand at any leading point of the compass. I register this circle, therefore, as exhibiting a special reference to the north-east, north, north-west, and south-east certain, and east, south, and west doubtful. (Plate XX, fig. 1.)

There is a detail of construction in this circle which I have never heard of elsewhere. In that part of it which is between east and south-east from the centre is an oblong enclosure 22 feet by 11, the east end of which is formed by the circle itself, the other stones of which it is composed being only 3 feet high.

I have no evidence as to its purpose, but it suggests an inner court or sanctuary.

At Swinside (or, as it used to be called, Swineshead), about six miles north from Millom, in Cumberland, and four west from Broughton in Furness, is a circle, the last I have to describe, which Gough (Camden's "*Britannia*," p. 432) says the country people call the "Sunken Kirk," i.e., the church sunk into the earth; a name which, I may point out, suggests a tradition of use for some dead and buried form of public worship. This circle, which is about 90 feet in diameter, has 55 stones remaining, the measurements of which vary from 1 to 8 feet; the entrance, 6 to 7 feet wide, is marked by a second stone placed on each side of it outside the circle, and faces nearly south-east. Gough speaks of some stones sunk in the earth in the centre which are not now visible. I did not find any outlying stones, but there is a very prominent hill almost due south-west from the centre of the circle, and towards the north-east there is a lower group of three summits. I therefore register this circle as having special references to the north-east, south-west, and south-east. (Plate XX, fig. 2.)

It does not appear from the accounts given of these remains by the antiquaries of former generations that they have suffered any great damage during the last hundred years or more, though many unnoted stones near "Long Meg" seem to have been moved and broken within the last thirty years.

Extremely excellent plans and descriptions of the three circles I have just described have been published in the *Journal of the British Archaeological Association* (1878) by Mr. C. W. Dymond, C.E., F.S.A., to which I may confidently refer you for any further or more minute details as to the sizes of the stones, &c. Mr. Dymond points out that the stones of all these circles are set in a slight bank, the banks at Keswick and Swinside being composed of small stones so as to make the larger ones stand more steadily; and that, all three being furnished with specially marked entrances, it is more probable that they were used for processional ceremonies of some kind than that they were, as some would have us believe, places of interment and nothing else. Mr. Dymond, who has also surveyed several other circles in the same minutely accurate manner, says, in a letter to me: "I too have in many instances observed the reference of striking features to a north-east and south-west line, but not with sufficient emphasis or consistency to lead to forming any theory on the subject."

On referring to the annexed table, showing the totals of the previous list of eighteen circles added to the tabulated particulars of the three circles just described, we find a vast preponderance

of striking features towards the north-east in particular, and also in the line north-east to south-west, and on looking more minutely at the details of each case we find some other points worthy of note. Where the ground is comparatively flat we find single outlying stones or other circles, but in very hilly countries the single stones seem to lead the eye up to prominent hill-tops, or even to be altogether superseded by them. I have frequently thought that an objection might fairly be made to the connection of the circles with the hills on account of the distance between them, and I was therefore pleased to find, from Sir Charles Warren's book, "*The Temple or the Tomb*," that there was an altar on the Mount of Olives to which the High Priest and his assistants went annually in procession from the Temple at Jerusalem, and where they burnt a heifer, and that this altar was due east or slightly north of east from the sanctuary, according to the Talmud, which says, "All the walls were high except the eastern wall, that the priest who burned the heifer might stand on the top of the Mount of Olives and look straight into the door of the sanctuary when he sprinkled the blood." Taking this fact in conjunction with the vision of Ezekiel (viii, 16), in which he saw "at the door of the temple of Jehovah, between the porch and the altar, about five and twenty men, with their backs toward the temple of Jehovah and their faces toward the east" (that is toward the Mount of Olives), worshipping "the sun toward the east," it would seem probable that this annual procession to the Mount of Olives was in some measure a Judaic concession to an earlier sun worship, such as has been frequent in Christian times and countries; nor is it unlikely that that part of the vision of Ezekiel was simply a statement of a very usual occurrence, for, says Captain Conder in his "*Heth and Moab*"—"The menhir is the emblem of an ancient deity, the circle is a sacred enclosure without which the Arab still stands with his face to the rising sun." My special object, however, in mentioning the Mount of Olives is to show that there is nothing unreasonable in connecting a prominent hill with a sanctuary or circle at a moderate distance from it, and so high a value is attached to anything relating to the temple at Jerusalem that I presume no better instance could be wished for; indeed, I rather fear that this possible similarity may be seized upon by some ingenious people as a 999th identification of the British with the lost tribes, but I would remind any such persons that sun-worship was not so much a Jewish as a Canaanitish practice, or perhaps I should say a practice more or less common to all pagans. An American traveller, Dr. Robinson, says, for instance, of a temple at Baal Hermon, "It fronts directly upon the great chasm, looking up the mighty

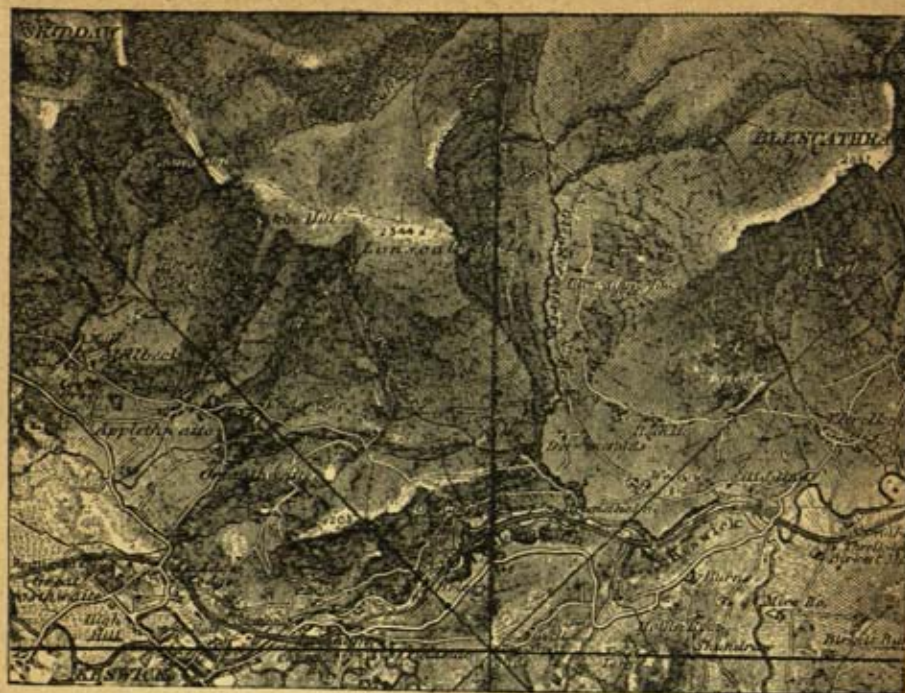


FIG. 1.—THE "DRUID STONES" NEAR KESWICK.



FIG. 2.—CIRCLE AT SWINSIDE, CUMBERLAND.

gorge as if to catch the first beams of the morning sun rising over Hermon."

There is yet another point worth noticing about these outlying hills, which is indeed that which I referred to in the first instance as being particularly remarkable, namely, that on the north-east side of the circle we frequently find a group of three summits instead of a single summit; this is the case at Penmaenmawr, at the Hoar-stone in Shropshire, and at two out of three of the Cumbrian circles I have just described; and it may also be the case elsewhere, without having been noticed even by myself, for it is not until several instances have forced themselves upon one's observation that any importance is attached to them. In other directions than the north-east I have only noticed single summits, and a symbolism of three and one may often be detected in the arrangement of the stones of our rude stone monuments. The Abbé Collet (writing about 1869) says that there is a belief in a certain part of Brittany that the sun rising over the Pic de Malabri presents on Trinity Sunday three discs which afterwards unite in one; here we have the sun and the mountains mixed up with a trinitarian belief in a manner which is doubtless the result of some such ancient superstition or symbolism as I suppose to have influenced the builders of the rude stone monuments. Triple summits, indeed, as, for instance, the Eildon Hills, have always been an object of superstitious traditions, and the life-giving rays of the sun falling into a circle over a triple summit may not unreasonably be regarded as an instance of phallic symbolism.

In the relation between stone circles and adjacent hills and outlying stones, we may therefore find suggestions not only of sun-worship, but of mountain worship and phallic worship, not all of which, however, would necessarily have been any more obvious to every worshipper in the circles than are the emblems which the initiated can trace in the architecture of our own ecclesiastical buildings to every worshipper in them.

Amongst the many curious points connected with this subject of orientation, I must, in conclusion, call your attention to the following:—The sides of all rectangular sacred buildings in Egypt were set north, east, south, and west; but in Chaldea the angles of the sacred buildings, with only one known exception, were set to those points, so that the sides faced north-east, south-east, south-west, and north-west, the north-east side being called the Eastern region (so that the north-east and the east may be regarded as very much the same for all symbolic purposes), the south-east side being called the Southern region, the south-west side the Western region, and the north-west side the Northern region. The Greeks looked on the omens that

appeared to their right as being prosperous, but the Romans looked on those that appeared to their left as being prosperous. Cicero noticed this difference, but I do not know that he or any one else has ever fully explained its cause, which I take to be this:—The Greeks in their augural ceremonies turned their faces to the north, and their right hands to the east, so that the favourable quarter would be in the north-east; but the Romans stood facing the east, so that the north-east or favourable quarter was on their left. We see, then, that both peoples considered the favourable quarter to be the north-east, which is the quarter I have shown to be most favoured by the circle-builders, the south-east aspect being reserved by them for sepulchral chambers and winter altars, even as the statue with a southern aspect at Memphis, which Herodotus speaks of, went by the name of winter, and was entirely neglected, while that which looked to the northward was adored under the name of summer. The small amount of evidence which I have as yet obtained indicates that the Roman temples were placed like those of Egypt, but I am not certain about the Greek buildings; some I know followed the Egyptian rule, but the Lycian tombs, great part of one of which was placed by Sir C. Fellows in the British Museum, followed the Babylonian system. There may even be a certain correlation of the Roman augural position with the Egyptian system of orientation, and of the Greek augural position with the Chaldean system of orientation: for, if a man stood at the north-east or fortunate angle of a square set in the Egyptian manner he might assume either the Greek or the Roman position, probably the latter; but if the square were set in the Chaldean manner, he would almost certainly assume the Greek position. The positions of the outlying stones and hills in reference to the circles seem, however, to be more in accordance with the Chaldean system of orientation than with the Egyptian,¹ nor is this the only thing in which a resemblance may be traced between the customs of Western Europe and Chaldea.² It may be that an indirect Chaldean influence was conveyed in our direction by a Greco-Phœnician channel, and that this question of orientation may hereafter be found to have some small value amongst other things in indicating different lines along which thought and culture have travelled.

¹ The annexed table shows many more references, not only to the north-east, but to the south-west, south-east, and north-west, than to the north, east, south, or west, especially when the proportion between certain and doubtful is taken into account.

² See my paper on "Apparent Coincidences of Custom and Belief among the Ancient Chaldeans and Peoples of Western Europe" in the "*Journ. Anthropol. Inst.*" for 1876.

SECOND LIST OF CIRCLES measured in Southern Britain, showing the nature and direction of any apparent references in them or by external objects, to different points of the compass.¹

Name.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
<i>Long Meg and her Daughters</i> (near Penrith, Cumberland).	...	Stone or stones, formerly standing 60° N. of E. from centre of circle.	...	...	...	"Long Meg" and entrance S.W. from centre of circle.	...	...
<i>Druid's Temple</i> (Kewick, Cumberland).	Entrance at N.	Triple summit of Blencathra Mountain to N.E.	{ Doubtful. A hill-top.	Largest stone in circle and hill-top in line. Small enclosure in S.E. quarter of circle. Entrance at S.E.	{ Doubtful. A hill-top.	...	{ Doubtful. A hill-top.	Skiddaw Mountain and fallen stone to N.W. ²
<i>Sunken Kirk</i> (Swinside, Cumberland).	...	Three hill-tops to N.E.	...	Entrance at S.E.	...	Summit of Black-combe due S.W.	...	{ A high hill, but not standing out so clearly as the others. Doubtful.
Total of second list...	3 1 certain.	3 certain. 15 { 11 certain. 4 doubtful.	1 doubtful. 3 doubtful.	2 certain. 7 { 4 certain. 3 doubtful.	1 doubtful. 4 { 3 certain. 1 doubtful.	2 certain. 6 { 5 certain. 1 doubtful.	1 doubtful. 2 doubtful.	2 { 1 certain. 1 doubtful. 2 certain. 4 { 2 doubtful.
Total of first list ...	18	18	3 doubtful.	9 { 6 certain. 3 doubtful.	5 { 3 certain. 2 doubtful.	8 { 7 certain. 1 doubtful.	3 doubtful.	6 { 3 certain. 3 doubtful.
Total of both lists ...	21 1 certain.	18 { 14 certain. 4 doubtful.	4 doubtful.	9 { 6 certain. 3 doubtful.	5 { 3 certain. 2 doubtful.	8 { 7 certain. 1 doubtful.	3 doubtful.	6 { 3 certain. 3 doubtful.

¹ First List published in "Journ. Anthropol. Inst.," November, 1882.² Mr. Dymond has lately suggested to me that this stone may be part of a circle which Stukeley says formerly existed in the next field.

Explanation of Plate XX.

Fig. 1.—Reproduction of part of Sheet 29 (formerly 101, south-east) of the One-inch Ordnance Map of England, showing the relation of the circle near Keswick to Skiddaw and Blencathra.

Fig. 2.—Reproduction of part of Sheet 98, south-west of the One-inch Ordnance Map, showing the position of the Swinside Circle in relation to Blackcombe.

N.B.—In both maps the circles are situated at the junction of the radiating lines, which run due north and south, east and west, north-east and south-west, and north-west and south-east.

DISCUSSION.

Dr. MICHAEL W. TAYLOR, late of Penrith, expressed his estimation of the value of Mr. Lewis' observations on the prehistoric monuments of Cumberland. Probably from not having had his attention directed to the subject, the speaker had failed to observe the point brought forward by the author, of the relation of the principal stones in these circles to the prominent features of the country or to a given direction of the compass. With some of these circles, however, there were connected avenues of stones, notably at Shap, where the direction of the line of stones was from south-east to north-west. On the plateau of Moor Dimmock above Ullswater, he had explored the numerous partially obliterated sepulchral remains which cover that area, and he found cairns and circles connected together by a double line of stones, forming an avenue, extending also in the direction of south-east and north-west. Here also existed the remains of one of the great 100 feet circles, similar to those of Keswick, Eskdale Moor and Gunnerkeld. This, like the above-named circles, contained within the enclosure three or four supplemental cairns or barrows, in this case attached to the inner circumference of the boundary along the northern semicircular segment. In other cases these included cairns lay separate within the area. He referred also to the singular configuration of two cairns existing on Moor Dimmock. From the circumference of these there proceeded three spoke-like projections or pavements of stone, extending radially to a distance of 20 or 30 feet. The directions in which these causeways point are a little to the south of east, to the south, and a little to the north of west. To these he had given the name of "Star-fish cairns." A corroboration of the same formation of structure has been afforded by the discovery lately of a similar cairn at Clava on Culloden Moor.

Mr. LEWIS said that the cairns and circles connected by a double line of stones and the very curious "Star-fish" cairns which Dr. Taylor had mentioned were no doubt sepulchral, and the direction followed by them was that which he had already pointed out as

belonging to sepulchral monuments rather than to those for worship or assembly, namely, north-west to south-east. He was not surprised that the question of the relation of outlying stones and hills had not attracted Dr. Taylor's attention. If he himself had not first made acquaintance with Stonehenge and the Roll-rich, and been led by a similar position of the "Friar's Heel" and the "Kingstone" respectively, in reference to those circles, to look in other cases for what he could find outside the circles, he would probably not have noticed the peculiarities he had pointed out regarding the circles in Cumberland and elsewhere. A Shropshire archæologist, referring to his paper on Shropshire circles, which was published by the Institute, and illustrated by a reproduction from the Ordnance map, had lately written to him saying: "Mitchell's fold, &c., I have often visited, and am surprised at the accuracy of the bearing of the Hoarstone from it; . . . the line you draw on your map over Stapeley Hill is almost exactly correct for the point of sunrise." This gentleman, like Dr. Taylor, though a constant visitor to the monuments of his own county, had not had his attention called to the question of outlying stones and hills, and for that reason only had not noticed the coincidence. The evidence of the Ordnance map on these matters was very gratifying, since they had been prepared long before he had taken the subject up, and by surveyors whose authority could not be questioned.

ANNUAL GENERAL MEETING.

JANUARY 26TH, 1886.

FRANCIS GALTON, ESQ., F.R.S., *President, in the Chair.*

The Minutes of the last Anniversary Meeting were read and signed.

The PRESIDENT declared the ballot open, and appointed Mr. G. M. ATKINSON and Mr. M. J. WALHOUSE scrutineers.

Mr. F. G. H. PRICE, the Treasurer, read the following Report for the year 1885, which was adopted.

TREASURER'S REPORT FOR 1885.

The amount received from subscriptions still shows a steady increase, being £520 16s., against £514 10s. last year; we have also received £48 6s. for arrears, making a total of £569 2s., as against £534 9s. in 1884.

The sale of publications has produced rather less than last year, when the amount received was increased by exceptional sales, including some complete sets.

The total amount received, exclusive of £100 contributed by the Zoological Society towards the cost of Library fittings, has been £694 7s. 5d.; this shows an advance of £22 6s. 6d. upon the corresponding receipts of last year.

On the debit side, the first payment is for rent to the Zoological Society, £163 15s. The cost of printing four numbers of the *Journal* has been £163 3s. 6d., against £206 12s. 9d. last year, and £254 5s. 6d. in 1883. The illustrations have cost £27 8s. 8d., or £4 5s. 1d. less than those of the four previous numbers.

The cost of publishing Mr. Man's monograph on the Andaman Islanders has been £34 17s. 6d., and Miscellaneous printing has cost £28 11s., against £31 4s. 2½d. last year, and £39 6s. 4d. in 1883.

The cost of postage and office expenses shows a slight increase over last year, but is less than in 1883.

The house expenses amount to £42 17s., being a reduction of £13 8s. 4d. on the payments made last year, and being less than the cost of previous years, but this included coals and lights, which are now paid for under the head of rent.

The balance is £176 17s. 11d., against £170 9s. 7½d., showing an increase of £6 8s. 3½d.

The total current expenses of the year have been £46 2s. 11½*d.* less than the current expenses of last year, and £60 5s. 3½*d.* less than in 1883.

The subscriptions in arrear amount to £176 8s., against £139 13s. this time last year; about two-thirds of this may be considered good.

Three life compositions have been received during the year, but as five compounders have died during the same period no money has been invested.

F. G. HILTON PRICE.

ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.

Receipts and Payments for the Year ending 31st December, 1885.

RECEIPTS.			PAYMENTS.		
	£	s. d.		£	s. d.
BALANCES, January 1st, 1885:			RENT, one year to September, 1885.....		163 15 0
At Bankers	165	3 1	PRINTING:		
In Office.....	5	6 6½	Journal, Nos. 48, 49, 50, 51	163	3 6
		170 9 7½	Mr. Man's Monograph	34	17 6
SUBSCRIPTIONS:			Miscellaneous	28	11 0
Paid to Messrs. Roberts & Co.	82	19 0	LITHOGRAPHY, &c.	226	12 0
" Collector	437	17 0	SALARIES AND COLLECTOR'S COMMISSION	27	8 8
" " due 1884	48	6 0	POSTAGES:	165	19 1
DONATION.....	569	2 0	Journal	15	14 8
Zoological Society (towards the expenses of Library fittings)	2	2 0	Letters and Post Cards	16	17 3½
SALE OF PUBLICATIONS:	100	0 0	Book Parcels and Circulars	2	4 8
Messrs. Trübner & Co.	88	7 9	ADVERTISING	34	16 7½
Messrs. Longmans & Co.	1	0 9	LIBRARY FITTINGS	3	19 3
Office:			EXPENSES OF EXHIBITING THE LAPPS.	100	0 0
Journals.....	2	15 7	OFFICE:		1 5 0
Other Publications	0	8 0	Stationery		
DIVIDENDS:			Receipt Stamp, &c.	8	16 10½
Four quarters on £900, 3½ per cent. MET.	92	12 1	Insurance	4	0 0
STOCK	30	10 4	Carriage of Parcels	1	0 0
			Miscellaneous	4	14 1
				2	14 6½
				21	5 6

<u>£964 16 0½</u>		
HOUSE:		
Assistance and cleaning rooms.....	17 12 0	
Refreshments at Evening Meetings	25 5 0	
	<u>42 17 0</u>	
BALANCES:		
At Bankers	171 1 11	
In Office.....	5 16 0	
	<u>176 17 11</u>	
	<u>£964 16 0½</u>	

F. G. HILTON PRICE, *Treasurer*.

Examined and found correct.

(Signed) EDWARD W. BRABROOK, }
J. E. KILLICK, } *Auditors*.

January, 1886.

Mr. F. W. RUDLER, the Director, then read the following Report:—

REPORT OF THE COUNCIL OF THE ANTHROPOLOGICAL INSTITUTE
OF GREAT BRITAIN AND IRELAND FOR 1885.

During the past year thirteen ordinary meetings have been held, in addition to the Anniversary Meeting. In the course of the year the following twenty-eight papers have been communicated to the Institute:—

1. "On the People of East Equatorial Africa." By H. H. Johnston, Esq., F.Z.S., F.R.G.S.
2. "Notes on the Race-Types of the Jews." By Dr. A. Neubauer, M.A.
3. "The Racial Characteristics of Modern Jews." By Joseph Jacobs, Esq., B.A.
4. "Certain Burial Customs as illustrative of the Primitive Theory of the Soul." By James G. Fraser, Esq., M.A.
5. "The Sculptured Dolmens of the Morbihan." By Rear-Admiral F. S. Tremlett, F.R.G.S.
6. "The Natives of New Ireland and its Archipelago." By A. J. Duffield, Esq.
7. "Hints on Vision-Testing." By R. Brudenell Carter, Esq., F.R.C.S.
8. "Eyesight of Savage and Civilised People." By C. Roberts, Esq., F.R.C.S.
9. "On the Inhabitants of Tierra del Fuego." By J. G. Garson, Esq., M.D.
10. "The Kecip-Sesotators, or Ancient Sacrificial Stone of the North-West Tribes of Canada." By Mons. Jean L'Heureux.
11. "On the Past and Present Condition of Certain Rude Stone Monuments in Westmoreland." By A. L. Lewis, Esq., F.C.A.
12. "The Origin and Characteristics of the Maoris in the King Country, New Zealand." By J. H. Kerry-Nicholls, Esq., F.R.G.S.
13. "On the Lapps." By Prof. A. H. Keane, B.A.
14. "The Physical Characteristics of the Lapps." By J. G. Garson, Esq., M.D.
15. "The Language of the Eskimo." By Dr. H. Rink.
16. "On the Physical Characteristics of the Natives of the Solomon Islands." By H. B. Guppy, Esq., M.B., F.G.S.
17. "On the Sakais." By Abraham Hale, Esq.
18. "Notes on the Astronomical Customs and Religious Ideas of the Chokitapia or Blackfoot Indians." By Mons. Jean L'Heureux.
19. "Observations on the Mexican Zodiac and Astrology." By Hyde Clarke, Esq.
20. "On the Primary Divisions and Geographical Distribution of Mankind." By James Dallas, Esq., F.G.S.
21. "Experiments on Testing the Characters of School Children." By Mrs. Bryant, D.Sc.
22. "A Comparative Estimate of Jewish Ability." By Joseph Jacobs, Esq., B.A.
23. "Insular Greek Customs." By J. Theodore Bent, Esq.
24. "A Game with a History." By J. W. Crombie, Esq., M.A.
25. "Migrations of the Kurnai Ancestors (Gippsland)." By A. W. Howitt, Esq.
26. "The Nicobar Islanders, with special reference to the Inland Tribe of Great Nicobar." By E. H. Man, Esq.

27. "Ancient British Lake-Dwellings and their relation to Analogous Remains in Europe." By R. Munro, Esq., M.D.

28. "On Three Stone Circles in Cumberland, with further observations on the relation of Circles to outlying Stones and adjacent Hills." By A. L. Lewis, Esq., F.C.A.

In addition to these Papers there have been many contributions to the Institute, some of considerable value, in the shape of notes, and numerous exhibitions of objects of ethnological interest, which have formed prominent features at the evening meetings. On the occasion when Professor Keane read his paper on the Lapps, the Council was fortunate in obtaining permission from the authorities of the Alexandra Palace for the exhibition of a group of Lapps—men, women, and children—accompanied by their dogs, sledges, and other objects illustrative of their mode of life.

The four numbers of the *Journal* for the year, namely, Nos. 50, 51, 52, and 53, have appeared with punctuality. These numbers contain 474 pages of letterpress, with 13 plates of illustrations, and several large folding tables.

The Institute has also published during the year Mr. Man's "Monograph on the Inhabitants of the Andaman Islands," being a revised reprint of three papers which appeared in the *Journal* a year or two ago, accompanied by a paper on the "Language of the Andamanese," by Mr. J. A. Ellis, which was added to the volume at Mr. Man's expense.

During the past year 36 new members have been elected, of whom 34 are Ordinary, and 2 Honorary Members. On the other hand, the Institute has lost, either through death or resignation, 17 Ordinary Members and 5 Compounders.

The former and present state of the Institute, with regard to the number of Members, are shown in the following Table:—

	Honorary.	Corresponding.	Compounders.	Ordinary.	Total.
January 1st, 1885	45	79	91	271	486
Since elected ..	+ 2	..	+ 3	+ 31	+ 36
Since deceased ..	- 4	- 3	- 5	- 2	- 14
Since retired ..	..	..	..	- 15	- 15
January 1st, 1886	43	76	89	285	493

From this table it will be seen that the Institute has acquired

during the year a net gain of 14 annual subscribing members. In addition to these, three new members have compounded.

The Council regrets to report that the Institute has lost through death four Honorary Members, namely, Dr. Lepsius, Dr. Lucae, Prof. Milne-Edwards, and Mr. W. S. W. Vaux; and the following Ordinary Members:—Mr. Luke Burke, Rev. J. Dingle, Dr. Kelburne King, Lieut.-Col. Conway Poole, Dr. Emil Riebeck, Mr. F. Thompson, and Mr. Cornelius Walford.

Brief obituary notices of some of the older members will appear in the *Journal*.

The Library of the Institute has received numerous valuable donations, among which may be specially noticed a large series of photographs of Lapps from Prince Roland Bonaparte; and a collection of about 100 volumes of modern works, chiefly books of travel, presented by Mr. H. Ling Roth.

The Council desires to remind the members that about ten years ago it was empowered to incorporate the Institute under the Companies' Acts. Preliminary steps were accordingly taken at the Board of Trade, but the negotiations were never completed.

The Council has lately had the subject again under serious consideration, and has come to the conclusion that it is advisable to secure the advantages of incorporation at once. With the view of simplifying the Articles of Association several clauses have been struck out of the old body of regulations, and some minor modifications have been introduced. The proposed Articles, in their revised form, will be submitted to the members at the Annual General Meeting, and if adopted, steps will immediately be taken to effect the incorporation.

The adoption of the Report was proposed from the Chair, and carried unanimously.

Mr. BRABROOK explained the alterations proposed to be made in the Regulations.

Mr. RUDLER read the Proposed Memorandum and Articles of Association, and after some discussion and slight verbal alterations,

Mr. BRABROOK moved, and Dr. COFFIN seconded the following resolution:—

“That the revised Regulations submitted by the Council be approved, and adopted as Articles of Association, subject to any modifications that may be required by the Board of Trade, which the Council are hereby empowered to make.” (Carried unanimously.)

The PRESIDENT then delivered the following address:—

PRESIDENT'S ADDRESS.

THE report of the Council has entered so fully into the working of this Institute during the past session, that I think I should weary you if I were to attempt a fresh summary of my own, and to speak again of topics that are still fresh in your memory. It is therefore better that I should select some definite topic in my address, and dwell upon it at length. I will do this now in respect to the subject that has chiefly occupied my attention for some time past.

It will perhaps be recollected that, at the meeting last autumn of the British Association in Aberdeen, I chose for my Presidential Address to the Anthropological Section a portion of the wide subject of "Hereditary Stature." My inquiries were at that time advanced only to a certain stage, but they have since been completed up to a well-defined resting-place, and it is to their principal net results that I shall ask your attention to-night.

I am, happily, released from any necessity of fatiguing you with details, or of imposing on myself the almost impossible task of explaining a great deal of technical work in popular language, because all these details have just been laid before the Royal Society, and will in due course appear in their *Proceedings*. They deal with ideas that are perfectly simple in themselves, but many of which are new and most are unfamiliar, and therefore difficult to apprehend at once. My work also required to be tested and cross-tested by mathematical processes of a very technical kind, dependent in part on new problems; for the solution of which I have been greatly indebted to the

friendly aid of Mr. J. D. Hamilton Dickson, Fellow and Tutor of St. Peter's College, Cambridge. I shall therefore quite dis-embarrass myself on the present occasion from the sense of any necessity of going far into explanations, referring those who wish thoroughly to understand the grounds upon which my results are based, to the forthcoming memoir in the *Proceedings* of the Royal Society, and to that amplified and illustrated extract from my Address at Aberdeen, accompanied by tabular data, which appeared among the "Miscellanea" of the *Journal* of this Institute last November.

The main problem I had in view was to solve the following question. Given a group of men, all of the same stature, whatever that stature may be,—it is required to be able to predict two facts regarding their brothers, their sons, their nephews, and their grandchildren, respectively, namely, *first*, what will be their average height; *secondly*, what will be the percentage of those kinsmen whose statures will range between any two heights we may please to specify:—as between 6 feet and 6 feet 1 inch, 6 feet 1 inch and 6 feet 2 inches.

The same problem admits of another rendering, because whatever is statistically *certain* in a large number is the *most probable* occurrence in a small one, so we may phrase it thus: Given a man of known stature, and ignoring every other fact, what will be the probable average height of his brothers, sons, nephews, grandchildren, &c., respectively, and what proportion of them will probably range between any two heights we please to specify?

I have solved this problem with completeness in a practical sense. No doubt my formulæ admit of extension to include influences of a minor kind, which I am content to disregard, and that more exact and copious observations may slightly correct the values of the constants I use; but I believe that for the general purposes of understanding the nearness of kinship in stature that subsists between relations in different degrees, the problem is solved.

It is needless to say that I look upon this inquiry into stature as a representative one. The peculiarities of stature are that the paternal and maternal contributions blend freely, and that selection, whether under the aspect of marriage selection or of the survival of the fittest, takes little account of it. My results are presumably true, with a few further reservations, of all qualities or faculties that possess these characteristics.

Average Statures.—The solution of the problem as regards the average height of the kinsmen proves to be almost absurdly simple, and not only so, but it is explained most easily by a working model that altogether supersedes the trouble of calculation. I exhibit one of these: it is a large card ruled with horizontal lines 1 inch apart, and numbered consecutively in feet and inches, the value of 5 feet 8 inches lying about half way up. A pin-hole is bored near the left-hand margin at a height corresponding to 5 feet 8½ inches. A thread secured at the back of the card is passed through the hole; when it is stretched it serves as a pointer, moving in a circle with the pin-hole as a centre. Five vertical lines are drawn down the card at the following distances, measured horizontally from the pin-hole: 1 inch, 2 inches, 3 inches, 6 inches, 9 inches. For brevity I will call these lines I, II, III, VI, and IX respectively. This completes the instrument. To use it: Hold the stretched thread so that it cuts IX at the point where the reading of the horizontal lines corresponds to the stature of the given group. Then the point where the string cuts VI will show the average height of all their brothers; where it cuts III will be the average height of the sons; where it cuts II will be the average height of the nephews; and where it cuts I will be the average height of the grandchildren. These same divisions will serve for the converse kinships; VI, obviously so; III, son to a parent; II, nephew to an uncle; I, grandson to a grandfather. Another kinship can be got from VI, namely, that between "mid-parent" and son. By "mid-parental" height I mean the average of the two statures: (a) the height of the father, (b)

the transmuted height of the mother. This process, I may say, is fully justified by the tables already printed in our *Journal*, to which I have referred. (It is a rather curious fact that the kinship between a given mid-parent and a son should appear from my statistics to be of exactly the same degree of nearness as that between a given man and his brother.) Lastly, if we transmute the stature of kinswomen to their male equivalents by multiplying them (in inches) by 1.08, or say, very roughly, by adding at the rate of 1 inch for every foot, the instrument will deal with them also.

You will notice that the construction of this instrument is based on the existence of what I call "regression" towards the level of mediocrity (which is 5 feet 8 $\frac{1}{4}$ inches), not only in the particular relationship of mid-parent to son, and which was the topic of my address at Aberdeen, but in every other degree of kinship as well. For every unit that the stature of any group of men of the same height deviates upwards or downwards from the level of mediocrity as above, their brothers will on the average deviate only two-thirds of a unit, their sons one-third, their nephews two-ninths, and their grandsons one-ninth. In remote degrees of kinship, the deviation will become zero; in other words, the distant kinsmen of the group will bear no closer likeness to them than is borne by any haphazard group of the general population.

The *rationale* of the regression from father to son is largely to be ascribed (as was fully explained in the Address) to the double source of the child's heritage. That heritage is derived partly from a remote and numerous ancestry, who are on the whole like any other sample of the past population, and therefore mediocre, and partly only from the persons of the parents. Hence the parental peculiarities are transmitted in a diluted form, and the child tends to resemble, not his parents, but an ideal ancestor who is always more mediocre than they. The *rationale* of the regression from a known man to his unknown brother is due to a compromise between two conflicting pro-

bilities: the one that the unknown brother should differ little from the known man, the other that he should differ little from the mean of his race. The result can be mathematically shown to be a ratio of regression that is constant for all statures. The results of observation accord with, and are therefore confirmed by, this calculation.

Variability of Kinsmen above and below their Mean Stature.—

Here the net result of a great deal of laborious work proves, as in the previous case, to be extremely simple, and to be very easily expressed by a working model. A set of four scales can be constructed, such as I exhibit, one appropriate to each of the lines, I, II, III, and VI, and suitable for any position on these lines. They are so divided that when the centres of the scales are brought opposite to the points crossed by the thread, in the way already explained, we shall see from the divisions on the scales what are the limits of stature between which successive batches of the kinsmen, each batch containing 10 per cent. of their whole number, will be included. Smaller divisions indicate the 5 per cent. limits, or even narrower ones. The extreme upper and extreme lower limits are perforce left indefinite. Each of the scales I give deals completely with 99 per cent. of the observations.

The principal divisions on the movable scales that are appropriate to the several lines VI, III, II, and I, are given in the Table.

Per-cents. of included statures.		Divisions, upwards and downwards, from centres of the scales; in inches.		
		VI.	III.	II and I.
10	..	0.5	0.6	0.8
20	..	1.0	1.3	1.3
30	..	1.6	2.0	2.1
40	..	2.4	3.0	3.1
45	..	3.1	3.9	4.0
49.5	..	4.8	6.1	6.3

The divisions are supposed to be drawn at the distances there given, both upwards and downwards from the centres of the several scales, which have to be adjusted, by the help of the thread, to the average height of the kinsmen indicated in the

several lines. The percentage of statures that will then fall between the centre of each scale and the several divisions in it is given in the first column of the table. Example:—In line VI, 40 per cent. will fall between the centre and a point 2·4 inches above it, 40 per cent. will fall between the centre and a point 2·4 inches below it; in other words 80 per cent. will fall within a distance of 2·4 inches from the centre. Similarly we see that $2 \times 49\cdot5$, or 99 per cent. will fall within 4·8 inches of the centre.

In respect to the principle on which these scales are constructed, observation has proved that every one of the many series with which I have dealt in my inquiry, conforms with satisfactory closeness to the "law of error." I have been able to avail myself of the peculiar properties of that law and of the well-known "probability integral" table, in making my calculations. A very large amount of cross-testing has been gone through, by comparing secondary data obtained through calculation with those given by direct observation, and the results have fully justified this course. It is impossible for me to explain what I allude to more minutely now, but much of this work is given, and more is indicated, in the forthcoming memoir to which I have referred.¹

I know of scarcely anything so apt to impress the imagination as the wonderful form of cosmic order expressed by the "law of error." A savage, if he could understand it, would

¹ The following will be of help to those who desire a somewhat closer idea of the reasoning than I can give in a popular address:—

m = mean height of race = 68·25 inches.

$m \pm x$ = height of a known individual.

$m \pm x'$ = the probable height of an unknown kinsman in any given degree.

$\frac{x'}{x}$ (which I designate by w) = the ratio of mean regression: it is shown by direct observation to be $\frac{1}{2}$ both in the case of mid-parent to son, and of man to brother; it is inferred to be $\frac{1}{2}$ in the case of parent to son. It is upon these primary kinships that the rest depend.

The "probable" deviations ("errors") from the mean values of their respective systems are—

p = that of the general population = 1·70 inch.

b = that of any large family of brothers = 1·0 inch.

f = that of kinsmen from the mean value of $m \pm x'$.

Since a group of kinsmen in any degree may be considered as statistically

worship it as a god. It reigns with serenity in complete self-effacement amidst the wildest confusion. The huger the mob and the greater the anarchy the more perfect is its sway. Let a large sample of chaotic elements be taken and marshalled in order of their magnitudes, and then, however wildly irregular they appeared, an unsuspected and most beautiful form of regularity proves to have been present all along. Arrange the statures side by side in order of their magnitudes, and the tops of the marshalled row will form a beautifully flowing curve of invariable proportions; each man will find, as it were, a pre-ordained niche, just of the right height to fit him, and if the class-places and statures of any two men in the row are known, the stature that will be found at every other class-place, except towards the extreme ends, can be predicted with much precision.

It will be seen from the large values of the ratios of regression how speedily all peculiarities that are possessed by any single individual to an exceptional extent, and which blend freely together with those of his or her spouse, tend to disappear. A breed of exceptional animals, rigorously selected and carefully isolated from admixture with others of the same race, would become shattered by even a brief period of opportunity to marry freely. It is only those breeds that blend imperfectly with others, and especially such of these as are at the same time prepotent, in the sense of being more frequently transmitted than their competitors, that seem to have a chance of maintaining themselves when marriages are not rigorously controlled—as indeed they never are, except by professional breeders. It is on these grounds that I hail the appearance of every new and valuable type as a fortunate and most necessary occurrence in the forward progress of evolution. The precise way in which a new type comes into existence is untraced, but we may well suppose that the different possibilities in the

identical with a sample of the general population, we get a general equation that connects f with w , namely, $w^2 p^2 + f^2 = p^2$.

The ratio of regression in respect to brothers can be shown to depend on the equation $w = \frac{p^2 - b^2}{p^2} = \frac{2}{3}$ nearly.

groupings of some such elements as those to which the theory of pangenesis refers, under the action of a multitude of petty causes that have no teleological significance, may always result in a slightly altered, and sometimes in a distinctly new and a fairly stable position of equilibrium, and which, like every other peculiarity, admits of hereditary transmission. The general idea of such a process is easy enough to grasp, and is analogous to many that we are familiar with, though the precise procedure is beyond our ken. As a matter of fact, we have experience of frequent instances of "sports" useful, harmful, and indifferent, and therefore presumably without teleological intent. They are also of various degrees of heritable stability. These form fresh centres, towards which some at least of the offspring have an evident tendency to revert. By refusing to blend freely with other forms, the most peculiar "sports" admit of being transmitted almost in their entirety with no less frequency than if they were not exceptional. Thus a grandchild, as we have seen, regresses on the average one-ninth. Suppose the grandfather's peculiarity refused to blend with those of the other grandparents, then the chance of his grandson inheriting that peculiarity in its entirety would be as one to nine; and, so far as the new type might be prepotent over the other possible heritages, so far would the chance of its reappearance be increased. On the other hand, if the peculiarity blends easily, and if it was exceptional in magnitude, the chance of inheriting it to its full extent would be extremely small.¹ The

¹ The chance that the stature of the son will at least rival the stature of the father is not uniform; it varies with the stature of the father. The following table shows the value of the probability in various cases. Columns A contain the height of the fathers; the columns B show how many *per cent.* of the sons will be of at least the same height as their fathers.

A.		B.	A.		B.	A.		B.
feet.	inches.	per cent.	feet.	inches.	per cent.	feet.	inches.	per cent.
5	8½	50	6	0	15	6	4	1·4
5	9	42	6	1	9	6	5	9·7
5	10	31	6	2	5	6	7	0·3
5	11	22	6	3	3			

probability (easily to be calculated for any given instance by the "probability integral" tables) might even be many thousand times smaller. I will give for an example a by no means extreme case. Suppose a large group of men, all of 6 feet 5 inches in height, the statures of whose wives are haphazard, then it can be shown that, on an average, out of every thousand of the sons not more than seven will rival or surpass the height of his father. This consideration is extremely important in its bearing on the origin of species. I feel the greatest difficulty in accounting for the establishment of a new breed in a state of freedom by slight and uncertain selective influences, unless there has been one or more abrupt changes of type, many of them perhaps very small, but leading firmly step by step, though it may be along a devious track, to the new form.

It will be of interest to trace the connection between what has been said about hereditary stature and its application to hereditary ability. Considerable differences have to be taken into account and allowed for. *First*, after making large allowances for the occasional glaring cases of inferiority on the part of the wife to her eminent husband, I adhere to the view I expressed long since as the result of much inquiry, historical and otherwise, that able men select those women for their wives who on the average are not mediocre women, and still less inferior women, but those who are decidedly above mediocrity. Therefore, so far as this point is concerned, the average regression in the son of an able man would be less than one-third. *Secondly*, very gifted men are usually of marked individuality, and consequently of a special type. Whenever this type is a stable one, it does not blend easily, but is transmitted almost unchanged, so that specimens of very distinct intellectual heredity frequently occur. *Thirdly*, there is the fact that men who leave their mark on the world are very often those who, being gifted and full of nervous power, are at the same time haunted and driven by a dominant idea, and are therefore within a measurable distance of insanity. This weakness will

probably betray itself occasionally in disadvantageous forms among their descendants. Some of these will be eccentric, others feeble-minded, others nervous, and some may be downright lunatics.

It will clear our views about hereditary ability if we apply the knowledge gained by our inquiry to solve some hypothetical problem. It is on that ground that I offer the following one. Suppose that in some new country it is desired to institute an Upper House of Legislature consisting of life-peers, in which the hereditary principle shall be largely represented. The principle of insuring this being that (say) two-thirds of the members shall be elected out of a class who possess specified hereditary qualifications, the question is, What reasonable plan can be suggested of determining what those qualifications should be?

In framing an answer, we have to keep the following principles steadily in view:—(1) The hereditary qualifications derived from a single ancestor should not be transmitted to an indefinite succession of generations, but should lapse after, say, the grandchildren. (2) All sons and daughters should be considered as standing on an equal footing as regards the transmission of hereditary qualifications. (3) It is not only the sons and grandsons of ennobled persons who should be deemed to have hereditary qualifications, but also their brothers and sisters, and the children of these. (4) Men who earn distinction of a high but subordinate rank to that of the nobility, and whose wives had hereditary qualifications, should transmit those qualifications to their children. I calculate roughly and very doubtfully, because many things have to be considered, that there would be about twelve times as many persons hereditarily qualified to be candidates for election as there would be seats to fill. A considerable proportion of these would be nephews, whom I should be very sorry to omit, as they are twice as near in kinship as grandsons. One in twelve seems a reasonably severe election, quite enough to draft off the eccentric and incompetent, and not too severe to discourage the ambition of the

rest. I have not the slightest doubt that such a selection out of a class of men who would be so rich in hereditary gifts of ability, would produce a senate at least as highly gifted by nature as could be derived by ordinary parliamentary election from the whole of the rest of the nation. They would be reared in family traditions of high public services. Their ambitions, shaped by the conditions under which hereditary qualifications could be secured, would be such as to encourage alliances with the gifted classes. They would be widely and closely connected with the people, and they would to all appearance—but who can speak with certainty of the effects of any paper constitution?—form a vigorous and effective aristocracy.

I will not make any further claim on your kind attention to-night. There has been much business, the meeting has been a long one, and it is late. But before sitting down I should deny myself a pleasure if I did not advert to the many agreeable and instructive evenings that we have spent during the past session in this room, and to the apparently growing success of the Anthropological Institute. No small part of that success, and of the stability of this Society, is due, in my opinion, to the unostentatious, solid and judicious management of our Director that was, but whom I must now call by his new title, our Secretary, Mr. Rudler, and I am grateful for this opportunity of making so public an acknowledgment of his help. It now remains to express a fervent wish, that I know you will all share, that our Institute may continue to progress and ever worthily to fill its important and self-adopted post of the representative of Anthropology in this country.

It was moved by Professor FLOWER, seconded by Dr. BEDDOE, and carried unanimously—

“That the thanks of the meeting be given to the President for his address, and that it be printed in the *Journal* of the Institute.”

The SCRUTINEERS gave in their report, and the following gentlemen were declared to be duly elected to serve as Officers and Council for the year 1886 :—

President.—Francis Galton, Esq., M.A., F.R.S.

Vice-Presidents.—Hyde Clarke, Esq.; Lieut.-Col. H. H. Goodwin-Austen, F.R.S.; Prof. A. H. Keane, B.A.

Secretary.—F. W. Rudler, Esq., F.G.S.

Treasurer.—F. G. H. Price, Esq., F.S.A.

Council.—S. E. B. Bouverie-Pusey, Esq.; Sir W. Bowman, Bart.; E. W. Brabrook, Esq., F.S.A.; Sir George Campbell, K.C.S.I.; C. H. E. Carmichael, Esq., M.A.; W. L. Distant, Esq.; A. W. Franks, Esq., M.A., F.R.S.; J. G. Garson, Esq., M.D.; A. L. Lewis, Esq.; Prof. A. Macalister, F.R.S.; R. Biddulph Martin, Esq.; Prof. Meldola, F.C.S.; Prof. Moseley, F.R.S.; C. Peek, Esq., M.A.; J. E. Price, Esq., F.S.A.; Charles H. Read, Esq., F.S.A.; Charles Roberts, Esq., F.R.C.S.; Lord Arthur Russell, M.P.; Prof. G. D. Thane; M. J. Walhouse, Esq., F.R.A.S.

Dr. GARSON moved, and Mr. COLLINGWOOD seconded, a vote of thanks to the retiring members of the Council, to the Auditors, and to the Scrutineers, which was carried unanimously.

ANTHROPOLOGICAL MISCELLANEA.

THIRD ANNUAL REPORT of the BUREAU of ETHNOLOGY

To the Secretary of the Smithsonian Institution, 1881-2.

THE Third Annual Report of the Washington Bureau of Ethnology, under the able directorate of Major Powell, although not quite so profusely illustrated as its predecessors, is not one whit behind them in interest.

The Bureau of Ethnology is doing excellent work in encouraging and promoting the systematic examination of all American antiquities, whether consisting of relics from the grave mounds; Mexican, Peruvian, and Central American sculptures, paintings, and pottery; or the still more intricate subjects of language, religion, myths, customs, &c. The volume before us contains articles upon all these subjects, commencing with an account of the work of the Bureau during the year. The field work appears to have been very actively carried out, and to have been productive of an immense amount of information, as well as of innumerable relics of value, to add to the already stupendous collection at Washington.

Mr. Cushing continues his researches among the Zunis and another isolated tribe known as the Coconinos, who have their habitations three thousand feet below the level of the plains, and who would appear to be the people, the smoke from whose village was seen by the Ives expedition. In Western Arizona he also discovered some remarkable strongholds, and is now completing his investigations into the religious orders and dance societies of the Zunis. Mr. Stevenson has added largely to the collections from the ancient ruins of Arizona and New Mexico. Mrs. Erminnie Smith has been busily engaged in continuing her Iroquoian investigations. Mr. Gatschet has been usefully employed in studying the language and customs of several tribes now almost extinct, whilst various other workers have given their time to the exploration of mounds in Tennessee, Arkansas, Ohio, Virginia, and Florida.

The office work is not less valuable, including dictionaries of Indian languages, and additions to several of the valuable articles which have already appeared, among which may be especially mentioned "Gesture and Sign Language" by Colonel Garrick Mallery, and "Mortuary Customs and Medical Practices" by Dr. H. C. Yarrow.

Of the publications of the year three papers, each of great interest, were published in Vol. V of "Contributions to North American Ethnology," a copy of which was presented to the Institute; they were entitled—I. "Observations on Cup-shaped and other Lapidarian Sculptures," by Charles Rau, in which these sculptures in America are compared with those in the Eastern Hemisphere, and the conclusion is arrived at that a continued connection must have subsisted between America and Asia. II. "On Prehistoric Trephining and Cranial Amulets," by Robert Fletcher, M.R.C.S.Eng., for which Professor Broca's valuable pamphlet is taken as a text-book, the latest discoveries of the extension of the practice being added, as also a description of different modes of procedure. Dr. Fletcher seems to agree with Broca as to the object of these mutilations, which I had the honour of bringing to the notice of the Institute some years ago. III. "A Study of the Manuscript Troano," by C. Thomas, Ph.D., a very learned and elaborate paper, which, with a paper by the same author in the volume before us, entitled "Notes on Certain Maya and Mexican Manuscripts," seems likely to lead to the decipherment of Mexican hieroglyphs. The characters Mr. Thomas regards as to a certain extent phonetic, although not alphabetic, but syllabic; whilst some appear to be ideographic, and others simple abbreviated pictorial representations of objects. The manuscript Troano Mr. Thomas looks upon as intended as a ritual or religious calendar, to guide the priests in the observance of religious festivals, and in their numerous ceremonies and other duties. In the second paper Mr. Thomas compares the Maya and Mexican symbols and calendars, and from the study of both comes to the conclusion, first, that the groups and characters must be read around to the left, or opposite to the course of the sun; second, that the cross was used to symbolise the cardinal points; third, that the bird figures were used to denote the winds; fourth, that an intimate relation subsisted between the Mayan and Nahuattan tribes, and that the Mexican was the older form of hieroglyph, and consequently that the monuments of Yucatan and Copan are of later date than is generally supposed. This conclusion will not, we think, be readily accepted; the whole of the surroundings of the Copan and Yucatan monuments seem to speak of great antiquity, and if they were really derived from those of Mexico, they would rather tend to enhance the age of the latter. The most interesting and perhaps the most important paper of the present volume, from an anthropological point of view, is that on "Masks, Labrets, and certain Aboriginal Customs," by William H. Dall. In it the author treats of the origin of masks and the development in their use from a simple shield or protection to the face, to that of a social or religious symbol, worn elevated above the head to increase the height of the wearer, and also to the mask of death, placed over the face to hide it from evil spirits, leading to the preservation and ornamentation of the actual human face or head. Masks are classed by Mr. Dall as masks, maskettes, and maskoids, according

to their form and use, maskette being applied to objects resembling masks but worn above or below the face, and maskoid to those not intended to be worn at all, and consequently generally imperforate. The geographical distribution of masks is given by Mr. Dall as—1. North Papuan Archipelago; 2. Peru; 3. Central America and Mexico; 4. New Mexico and Arizona; 5. The region occupied by Indians from Oregon to the northern limit of the Thlinkit; 6. The Aleutian Islands; 7. The Eskimauan region from Prince William Sound to Point Barrow. This is a tolerably wide distribution, but it might have been extended to a great part of the Eastern hemisphere, and to a very remote epoch, especially as regards the mask for the dead, as witness those of gold discovered by Dr. Schliemann at Mycenæ. The illustrations of this paper are numerous and most useful to the student, one point of especial interest being the similarity, or it may be said the *identity*, of the carvings on the rattle of the Thlinkit, and figures from Mexico and Nicaragua, with masks from the South Seas. This leads Mr. Dall to the conclusion that America was visited, at different times, by people from the islands of the Pacific, a conclusion also adduced from the use of labrets and of tattooing.

Dr. Washington Matthews, who wrote upon Navajo Silversmiths in the second volume of the Reports, gives a paper on Navajo Weavers, beautifully illustrated and of great interest; whilst "Omaha Sociology," by the Rev. J. Owen Dorsey, will have many students, especially with regard to the tribal customs and affinities as affecting marriage regulations; whilst the paper by Mr. W. H. Holmes, on "Prehistoric Textile Fabrics of the United States derived from Impressions on Pottery," is highly suggestive. Mr. Holmes, by taking plaster casts from ancient pottery, gets an impression of the material used in ornamentation, in so perfect a manner that the mode of weaving or plaiting the cloth or mats so employed can be seen at a glance. It is to be hoped that this method may be extended to the ancient pottery of Europe and Japan, that a comparison may be instituted with regard to the modes of plaiting and weaving, and the materials employed in various countries. The remainder of the volume is taken up with the illustrated catalogue of a portion of the collection made by the Bureau of Ethnology during 1881, and a very formidable catalogue it is, but also extremely useful, as showing the locality and surroundings of the several finds, and giving illustrations of the more important of them.

A. W. BUCKLAND.

OBITUARY NOTICES.

Mr. LUKE BURKE, who died last August, was an original member of the Anthropological Institute, having joined the pre-existing Ethnological Society in 1861. A sketch of his work, from the pen of one of our members, the Rev. George St. Clair, F.G.S., appeared in "The Inquirer" for December 26th, 1885. Several ethnological periodicals were at various times started by Mr. Burke. In January, 1854, he launched a magazine under the title of "The Ethnological Journal," but only a single number appeared. In July, 1865, Mr. Burke made another attempt, and his new "Ethnological Journal" continued to appear monthly until March of the following year. Mr. Luke Burke contributed to this *Journal* articles on "The Place of Man in the Animate Scale," "On the Mythological Aspects of Ancient and Mediæval Chronology," and on the "Principles of Ethnology considered as an organised Science." In 1860 Mr. Burke started a monthly journal entitled "The Future," which, like his other serials, had only a brief existence. Mr. St. Clair refers to the lucid speeches which Mr. Burke occasionally contributed to the discussions at the meetings of the Ethnological Society under Mr. Crawford, and in later years at the meetings of the Anthropological Institute.

Dr. KELBURNE KING, of Hull, who had been a member of the Anthropological Society from 1864, and passed over to the Anthropological Institute as one of the original members, died suddenly on January 2nd, 1886. From a sketch of his life in *The Eastern Morning News*, forwarded to the Institute by Mr. C. Staniland Wake, the following particulars are taken. Dr. King was born on January 22nd, 1823, at Kilmalcolm, in Renfrewshire. In 1844 he graduated M.D. at Edinburgh. About thirty-five years ago he settled in Hull, and became surgeon to the Hull Infirmary. He subsequently held the post of Lecturer on Anatomy, and, at a later date, of Surgery, in the Hull and East Riding School of Medicine. As a student he had acted as demonstrator to Dr. Robert Knox. For many years Dr. King occupied the position of President of the Literary and Philosophical Society of Hull, and displayed great activity in promoting the interests of this Institution. Many of his presidential addresses and lectures have been published. On three occasions Dr. Kelburne King served as Mayor of Hull, and was conspicuously active in all local work of an educational, sanitary, and philanthropic character.

A long memoir of the late Dr. LEPSIUS, the eminent Egyptologist of Berlin, and an Honorary Member of the Anthropological Institute, appeared in the Report of the last Anniversary Meeting of the Royal Society of Literature. This obituary notice was contributed by Mr. C. H. E. Carmichael, M.A., the Hon. Foreign Secretary of the Society.

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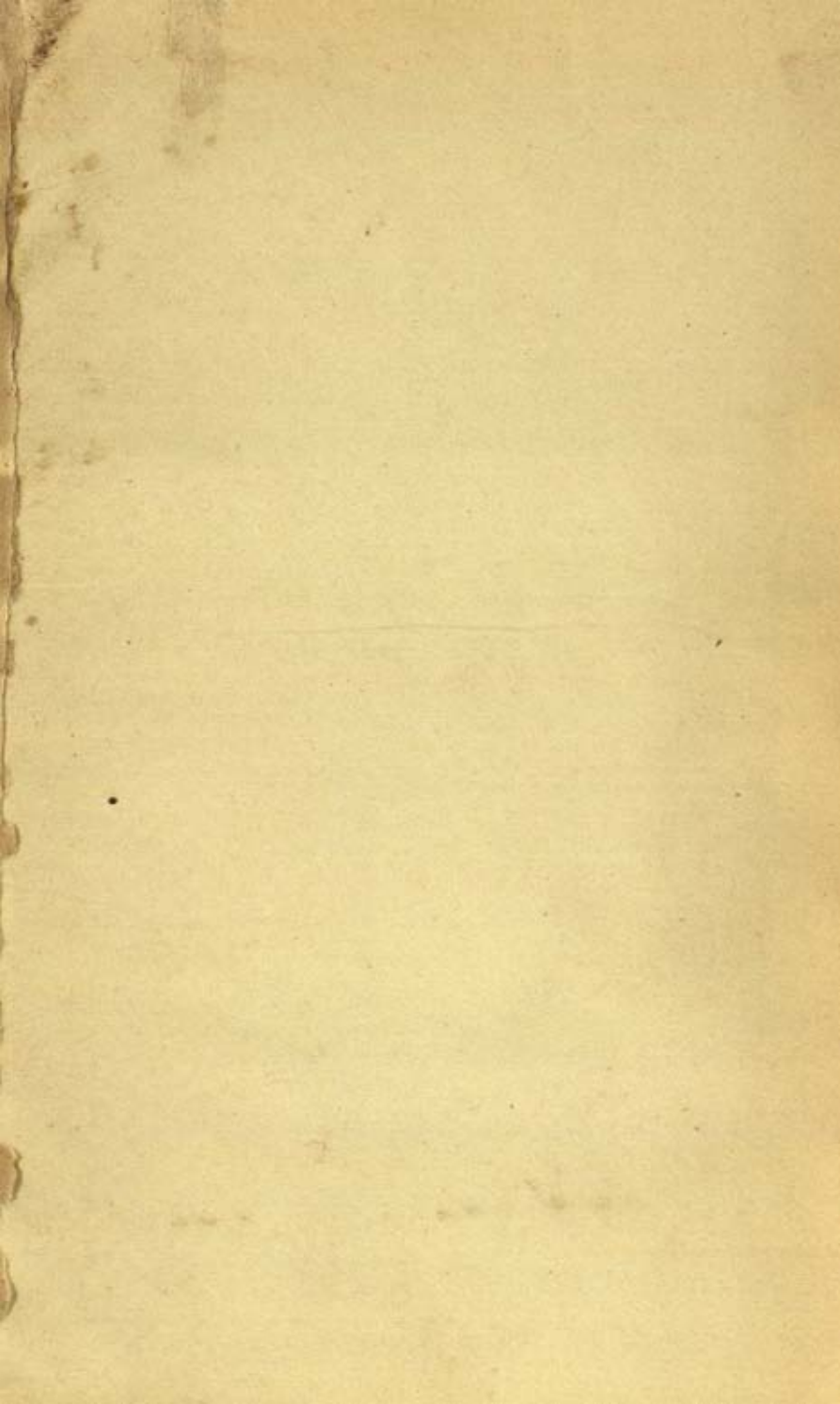
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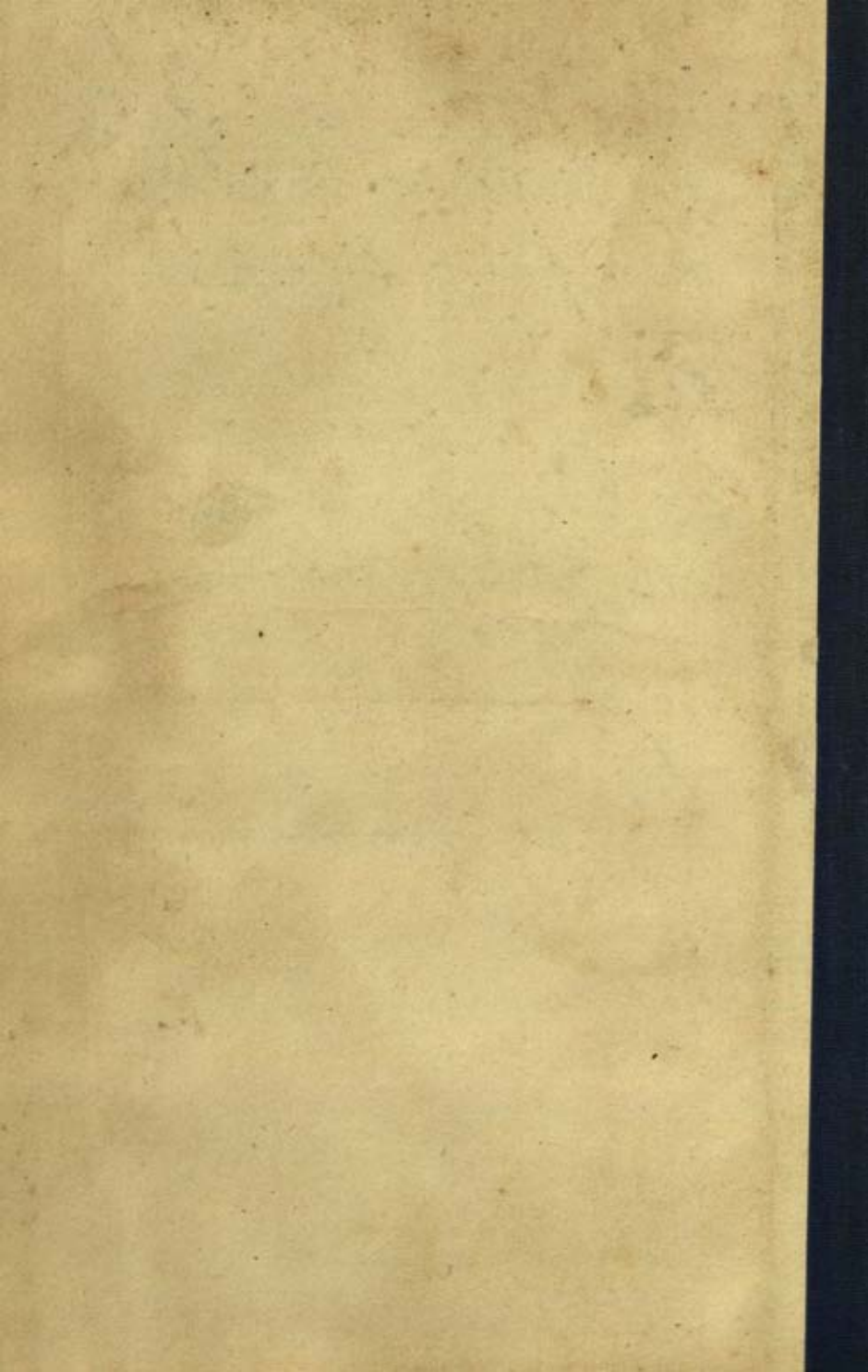
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